

ANNUAL REPORT



**PAKISTAN
SCIENCE
FOUNDATION**

1993-94



PAKISTAN SCIENCE FOUNDATION

**ANNUAL REPORT
1993-94**

**PAKISTAN SCIENCE FOUNDATION
CONSTITUTION AVENUE ISLAMABAD**

LETTER OF TRANSMITTAL

Dear Mr. Secretary,

I have the honour to enclose herewith the Annual Report of the Pakistan Science Foundation for the Fiscal Year 1993-94, alongwith its audited accounts, as adopted by PSF Board of Trustees for submission to the National Assembly as required by the Pakistan Science Foundation's Act No. III of 1973.

With regards.

Yours sincerely,

Dr. Bashir Ahmed Sheikh
Chairman
Pakistan Science Foundation
Islamabad

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

PAKISTAN SCIENCE FOUNDATION

CHAIRMAN

Dr. Bashir Ahmed Sheikh, M.Sc. (Hons) Physiology and Pharmacology, Ph.D. (Physiology)
Iowa State University, Ames, Iowa (USA).

EXECUTIVE COMMITTEE

Dr. Bashir Ahmed Sheikh	Chairman
Dr. Atique Mufti	Member Science
Mr. Sikandar Hayat Khan	Director/Member Finance

BOARD OF TRUSTEES

Non Existent

CONTENTS

<u>EXECUTIVE SUMMARY</u>	6
<u>INTRODUCTION</u>	12
CHAPTER-1 ACTIVITIES AND PROGRAMMERS	13
<u>PAKISTAN SCIENCE FOUNDATION (PSF)</u>	15
(A) RESEARCH SUPPORT SECTION	15
1 Research Support	15
a. Grants for Research Projects	15
b. Institutional Support	20
2. Research Evaluation	20
3. Scientific Societies/Learned Bodies	34
4. Travel Grants	36
5. Exchange of Visits	36
6. Awards and Fellowships	36
7. Scientists Pool	37
8. International Liaison	37
9. Planning and Development Program	38
(B) SCIENCE POPULARIZATION SECTION	38
1. Funding for Conferences, Symposia, Seminars, etc.	38
2. Organisation of Science Exhibitions/Fairs	41
a) National S&T Fair-1994	41
b) S&T Expo-1993	41
3 Popular Science Lectures	42
4 Science Film & Planetarium Shows	42
5. Distribution of Scientific Books & Magazines	42
6. Science Clubs Program	43
7. Science Posters Project	43
8. Inter Board Science Posters Contest	44
9. Intra Board Science Essay Competition	44
10. Science Caravan Activities	44
<u>PAKISTAN MUSEUM OF NATURAL HISTORY (PMNH)</u>	45
<u>PAKISTAN SCIENTIFIC & TECHNOLOGICAL INFORMATION CENTRE (PASTIC)</u>	52
CHAPTER-2 ORGANISATION & ADMINISTRATION	57
CHAPTER-3 AUDITOR'S REPORT	60
ANNEXURES: I) Pakistan Science Foundation Act.III, 1973	77

ABBREVIATIONS

Province

B	Balochistan
C	Centre
F	Frontier
P	Punjab
S	Sindh
AJK	Azad Jammu & Kashmir

Sponsoring Institutions

PDC	Poultry Development Centre
AEARC	Atomic Energy Agricultural Research Centre
AU	Agricultural University
BZU	Bahauddin Zakarya University
GU	Gomal University
EU	Engineering University
QU	Quaid-i-Azam University
KU	Karachi University
HG	Government College, Haripur
PU	Peshawar University/Punjab University
SU	Sindh University
VC	Veterinary College
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
NIBG	National Institute of Biotechnology and Genetic Engineering
UCR	University College of Rawlakot

Disciplines

AGR	Agricultural Sciences
BIO	Biological Sciences
ENG	Engineering Sciences

MED	Medical Sciences
PHY	Physical Sciences
CHEM	Chemical Sciences
MATH	Mathematical Sciences
EARTH	Earth Sciences
OCEANG	Oceanographical Sciences
ENVR	Environmental Sciences

EXECUTIVE SUMMARY

PAKISTAN SCIENCE FOUNDATION (PSF)

Pakistan Science Foundation is an apex body for promotion and funding of scientific and technological activities in the country. The activities undertaken by the Foundation for the performance of its statutory functions are divided into three broad categories:

- i) To promote basic and fundamental research in universities and research institutes on scientific problems related to socio-economic needs/development of the country.
- ii) To increase public awareness about science through science promotion activities by establishing museums, clubs, herbaria, planetaria and other allied activities.
- iii) To establish centers for comprehensive scientific and technological information systems.

The activities of the Foundation revolve around these objectives. The first function is carried out by the Science Wing of PSF while the second one is achieved through Science Promotion Section of PSF and Pakistan Museum of Natural History (PMNH) and the third through Pakistan Scientific and Technological Information Center (PASTIC). The activities during the year are reflected below.

RESEARCH SUPPORT:

Research Support is the principal program of the Foundation for the promotion of basic and fundamental research relevant to the socio-economic needs of the country. During 1993-94, a total of 172 projects/studies remained under consideration for funding. Among these 69 projects were newly received while 103 had been carried over from the previous year. Thirty six projects costing Rs. 12.894 million were sanctioned in the fields of Agriculture, Biology, Chemistry, Environment, Mathematics and Physics. In addition, an amount of nearly Rs. 0.074 million was released to four organizations as institutional support for purchase of laboratory materials and accessories.

For evaluation of 58 ongoing studies, technical reports including semi-annual and annual reports were received during the year and were assessed. Eleven studies/projects in various fields were completed and their final reports received. These reports were reviewed by the experts.

The studies/projects completed during the year were:

- A survey of toxigenic fungi in agricultural commodities.
- Clinical evaluation, acceptability and impact of normal and therapeutic diets proposed for healthy and sick population on human subjects.
- Ecological studies of mushrooms and toad stools of Kaghan valley.
- Production of medicinally important metabolites by rauwelfia cell cultures.
- Termites of desert zones of Pakistan.
- Exploratory survey on modulated wild plants carrying on atmospheric nitrogen fixation in forest area of district Poonch (Rawalakot) A.K.
- Systematic distribution of the flavonoids in Papilionoideae
- Isolation, structure elucidation and biological activity of the chemical constituents of some compositeae plants.
- Development of management model for optimum use of water resources under system constraints.
- Preparation and study of the high Tc super conductors.
- Numerical/experimental study of Z-Q pinch devices.

Scientific research was further supported by awarding annual grants-in-aid to various societies for their activities and publication of technical journals. During the year a total of Rs. 1.177 million were released for this purpose. Furthermore, three scientists were given travel grants to participate in international conferences abroad. The PSF also awarded fellowships for undertaking Ph.D. studies to two students.

PSF played host to 18 member Chinese S&T delegation on the occasion of 2nd S&T Fair organized by the Foundation in January-February, 1994 in Islamabad. Under the MOU with Royal Society, UK, two British scientists visited Pakistan and one Pakistani scientist visited UK during the year.

For encouraging higher studies, and proper utilization of highly qualified scientific personnel, PSF has established a "Scientists Pool". Under this program, five scientists were appointed for six months during the year under report.

SCIENCE POPULARIZATION:

PSF regularly gives financial assistance for holding conferences and seminars etc. During the year, twenty five (25) such activities were co-sponsored with a total amount of Rs. 0.587 million.

Pakistan Science Foundation puts great emphasis on increasing the awareness of people about scientific developments, and for the purpose, it organizes Science Fairs and exhibitions from time to time. In 1993-94, the Second National Science & Technology Fair was organized in January-February, 1994 at Islamabad. Besides, some 64 scientific/technological institutions, public/private organizations, NGOs and 13 institutions from China participated in the Fair. The Fair was opened by the Speaker of National Assembly of Pakistan, Syed Yousaf Raza Gilani, while Honourable President of Pakistan Sardar Farooq Ahmed Khan Leghari was the Chief Guest at the concluding ceremony.

To coincide with the fair, several important events were also arranged, which included a symposium, an aero-modelling contest, science quiz and essay competition, a walk for science and an exhibition of scientific models both working and static made by the school and college students.

Similarly, PSF organized the S&T Exposition, '93 during the 6th Meeting of OIC Ministerial Standing Committee on Scientific & Technological Cooperation (COMSTECH) from September 21-25, 1993 at Engineering Council, Islamabad. The President of Pakistan opened the exposition.

Arranging popular science lectures is a regular activity of PSF and during the year, two lectures on "Wildlife Conservation" and "Sulfur in Coals of Pakistan" were organized. For public awareness, 148 science film shows and 143 planetarium shows were organized in various schools of the country. The Science Clubs Program of the Foundation remained active and a number of items including colorimeters and books were distributed. Seventh set of 10 posters on science themes was also developed, printed and distributed to schools & NGOs.

Intra and Inter-Board Science Poster and Intra Board Essay contests were also organized during the year and the winner students were awarded cash prizes .

Science Caravan, another important activity for popularization of science organized exhibitions and shows throughout the year at various schools in the provinces and also at the fair and exposition.

PAKISTAN MUSEUM OF NATURAL HISTORY (PMNH)

Both research and public service activities continued in earnest during the year under review. PMNH was able to add as many as 3080 specimens of plants, animals, minerals and fossils etc. to its collection. These collections were made during 27 field trips undertaken by the three science divisions of the Museum. This material, alongwith other material already collected, was thoroughly researched upon. Based on this research, 19 research articles were published in scientific journals of international repute, including 10 in foreign journals.

Interaction between PMNH scientists and many foreign organizations also continued. The PMNH-Tokyo Museum interaction regarding Cryptogamic flora of Pakistan was concluded and the 2nd volume of "Cryptogamic Flora of Pakistan" was published. The collaborative work between PMNH and Florida State Museum, on small mammals of Pakistan also continued during its second year, while a new collaborative research program namely: "Altitudinal Distribution of Butterfiles of Northern Pakistan: Gilgit to Khunjerab" between PMNH and Oxford University was initiated.

PMNH was also fortunate in receiving back three of its personnel after obtaining advanced degrees from foreign countries including France, Germany and Malaysia.

The Museum remained busy in planning of its premises being shifted to new building which is scheduled to be completed to the extent, that will facilitate the accomodation of its Science Divisions.

PAKISTAN SCIENTIFIC AND TECHNOLOGICAL INFORMATION CENTRE (PASTIC)

PASTIC is another subsidiary organisation of PSF with the following objectives.

1. To collect, organize, classify and disseminate information in all disciplines of Science and Technology to the scientific community of Pakistan.
2. To develop inter-library cooperation for sharing resources.
3. To establish and maintain links with international/regional information networks/agencies.

4. To train information specialists in modern information handling and management techniques.
5. To develop and strengthen the National Science Reference Library.
6. To collect data on S&T information.

During the report period, 2552 requests for supply of articles were received, out of which 1717 were honored. Some 186 bibliographies were also prepared and supplied to clients.

Four issues of Pakistan Science Abstracts were published based on recent research articles in various Pakistan S&T journals.

Information to various S&T organizations including WAPDA, Planning Division and PCRWR were provided on wildlife conservation strategy, and water supply and sanitation

In the computerization field LAN (Local Area Networking) was established with seven intelligent terminals (computers). Besides, the software, hardware and desk top publishing services were provided to other S&T organisations. Under the development project some computer equipment was purchased.

The usual activities under CEHANET, INFO1ERRA and ASTINFO Programmes were undertaken which include provision of environmental information, IDAMS & CDS/ISIS software packages and distribution of publications of these networks. The Director, PASTIC attended the 1st Meeting of the Governing Board of SAARC Documentation Centre in New Delhi.

The National Science Reference Library acquired 990 issues of serials, 270 documents and 229 books.

Under the project "Strengthening of PASTIC National Science Reference Library", the databases MEDLINE, POLTOX & SCIENCE CITATION INDEX were purchased.

The Union Catalogue of 103 S&T libraries of Pakistan was printed and reprographic Unit undertook 154 printing jobs from 19 organizations which included composing, offset printing and binding.

Technological Information Promotion System (TIPS) based at PASTIC has been regularly publishing daily and weekly bulletins in Pakistan which provides up-to-the-minute and detailed information on technology and trade opportunities. It covers fourteen different sectors and has the largest data base in the world on trade/technology information from the developing countries. The sectors are

- | | |
|----------------------------|-------------------------|
| (i) Agro-Industries | (viii) Biotechnology |
| (ii) Energy | (ix) Textiles |
| (iii) Electronics | (x) Fisheries |
| (iv) Pharmaceuticals | (xi) Building Materials |
| (v) Business Opportunities | (xii) Chemicals |
| (vi) Food Processing | (xiii) Mining |
| (vii) Machinery | (xiv) Packaging |

During 93-94 technology/trade offers and requests came from 22 countries and were sent to 250 users in Pakistan . Pakistani enterprenuers /business organisations submitted information on 900 products/processes/technologies which were advertised abroad through TIPS network.

In 1994 PSF and TIPS arranged a computer exhibition in Lahore. TIPS also published its second book on TIPS trade and technology information in Urdu lanaguage.

INTRODUCTION

Pakistan Science Foundation was established on June 30, 1973 under the Pakistan Science Foundation Act No. III as an autonomous body to promote and finance scientific and technological activities having a bearing on the socio-economic needs of the country. Under the Act, the Foundation has been entrusted to carry out the following functions:-

- i) establishment of comprehensive scientific and technological information and dissemination centers;
- ii) promotion of basic and fundamental research in universities and other institutions on scientific problems 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 centers, clubs, museums, herbaria and planetaria;
- v) promotion of scientific societies, associations and academies engaged in spreading the cause of scientific knowledge in general or in the pursuit of a specific scientific discipline or technology in particular;
- vi) organisation 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 organizations and collection of scientific statistics related to the scientific efforts of the country.

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/engineers and doctors both in and outside Pakistan, and to assist them in collaboration with concerned agencies to seek appropriate employment; and
- iii) establish liaison with similar bodies in other countries.

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

CHAPTER - 1

ACTIVITIES & PROGRAMMES

The Activities and Programmes undertaken by the Foundation for the performance of its statutory functions can be broadly divided into four categories:-

- i. Establish Comprehensive Scientific & Technological Information & Dissemination Centers.
- ii. Promote & Finance Scientific Research in the country and the utilization of the research results.
- iii. Promote and Popularize Science in Society.
- iv. International Liaison.

The first activity is carried out through Pakistan Scientific and Technological Information Centre, a subsidiary organisation of PSF. The other functions i.e., research support, science popularization etc. are performed by the science section of the Foundation, which is divided into two sub sections as under:-

(A) Research Support Section performing the following activities.

1. Research Support.
 - a) Grants for Research Projects
 - b) Institutional Support
2. Research Evaluation.
3. Scientific Societies/Learned Bodies.
4. Exchange of Visits.
5. Awards and Fellowships.
6. Planning and Development Program.
7. Scientists Pool.
8. International Liaison.
9. Other Activities.

B) Science Popularization Section, which carries out the following activities;

1. Funding for Conferences, Symposia, Seminars, Workshops.
2. Organisation of Science Exhibitions/Fairs.

3. Popular Science Lectures.
4. Arranging Film/Planetarium & Slide Shows.
5. Distribution of Scientific Books & Magazines.
6. Science Club Program.
7. Science Posters.
8. Inter Board Science Posters Contest.
9. Intra Board Science essay competition.
10. Promotion of Science in Rural Areas through Mobile Science Exhibition (Science Caravans).

Another subsidiary organisation of Pakistan Science Foundation is the Pakistan Museum of Natural History, established in 1979 to serve the national needs in the vitally important areas of research, conservation & education involving Pakistan's heritage of natural resources. The Museum is a national repository for permanent storage of plants, animals, rocks, minerals & fossils of the country.

The progress of the work carried out by the Science Sections of the Foundation, PASTIC and PMNH during the year 1993-94 is summarized in the following pages.

PAKISTAN SCIENCE FOUNDATION

A. RESEARCH SUPPORT SECTION

The progress of the work done by the Research Support Section during the year, 1993-94 under various statutory functions entrusted to it, is summarized below.

1. Research Support

The promotion of basic and fundamental research in universities and other institutions on scientific problems relevant to the socio-economic development of country is an important function of PSF. The research support activities are carried out through following programs:-

- i) Grants for research projects submitted by individuals or groups of Scientists in the universities & research institutions in the country..
- ii) Institutional support- provision of equipment, literature, staff training facilities, etc., to build institutional capability for conducting research.
- iii) Support for participation in regional and international research programs.

a) Grants for Research Projects

Research Support is the principal program of the Foundation for the promotion of basic and fundamental research, having relevance to the socioeconomic needs of the country. During the period under report, 69 projects were received by the Foundation , whereas 103 project proposals which had been at various stages of their processing, were carried over from the previous year. Thus, in all 172 proposals remained under active consideration of the Foundation during the period 1993-94. The proposals were examined by the experts in relevant fields in the light of criteria laid down by the Foundation. The Criteria for research are: a) competence of the Scientific personnel to carry out the research, b) Institutional capability i.e. availability of requisite equipment, Laboratory and literature facilities, c) Scientific merit of the proposed research, and d) likelihood of completion of the project within the stipulated time. Each proposal after receipt of the initial review report, is placed before the relevant Technical Committee for technical evaluation and Executive Committee of the Foundation for final sanction.

During the report period 36 research projects were sanctioned at a total cost of Rs.12.894 million. Their 1st. installments amounting to Rs:5.69 million were released after signing of agreements. The details of new projects are given below:-

Number and Title of Scheme:	Name of P.I. & Organization supported:	Project Cost:
<u>Agricultural Sciences:</u>		
F-AU/AGR(114/1) Clinical evaluation, acceptability and impact of normal & therapeutic diets prepared for healthy and sick population of human subjects.	Dr. Tajammal Hussain, Dean, Faculty of Nutrition Sci., NWFP Agricultural University, Peshawar.	Rs. 87,026/-
P-CSIR/AGR (129) In vitro selection for salt tolerant strain of poorbiraya: an oil-crop	Dr. Mahmood Akram, Senior Scientific Officer, PCSIR Labs. Complex, Lahore.	Rs. 2,50,173/-
P-PU/AGR (137) Effect of echinococcosis in rabbits and sheep alongwith its control by indigenous plants of Pakistan.	Dr. Tanveer Akhtar, Assistant Professor, Deptt. of Zoology, University of Punjab, Lahore	Rs. 4,17,068/-
P-PU/AGR (138) Studies on the physiological adaptation during pregnancy and lactation in dwaf goat to improve its production.	Dr. Abdul Majeed Cheema, Department of Zoology, University of the Punjab, Lahore.	Rs. 3,62,671/-
AJK-UCR/AGR (142) Studies on the nature and application of fungi & bacteria controlling insect pests of Azad Jammu & Kashmir.	Mr. Riaz Ali Gardezi, Assistant Professor, University College of Agri., (A.J.K.) Rawalakot.	Rs. 4,72,841/-
S-AEARC/AGR (148) Improving productivity of salt affected lands through continuous cropping.	Mr. Abdul Nabi Khanzada, Principal Scientific Officer, Atomic Energy Agricultural Research Center, Tandojam.	Rs. 3,65,778/-
F-AU/AGR (149). Biological and chemical transformation of phosphorus and its availability to plants in NWFP (Pakistan) soils.	Dr. Mohammad Sariullah Sarir, Asstt. Professor, Deptt. of Soil Science, NWFP Agricultural University, Peshawar.	Rs. 2,62,803/-
P-PDC/AGR (151) Diagnosis and control of Avian Mycoplasmosis.	Mr. Ishtiaq Ahmed, Assistant Research Officer, Poultry Development Centre, Rawalpindi.	Rs. 3,98,748/60

<p>P-PDC/AGR (152) Isolation of locally prevailing strains and preparation of vaccine of IDB virus.</p>	<p>Dr. Shamsul Hasan, Senior Research Officer, Poultry Research Institute Shamsabad, Rawalpindi.</p>	<p>Rs. 3,28,611/-</p>
<p>P-NIBG/AGR (153). Characterization and improvement of plant growth promoting rhizo-bacterial (PGPR) and their effect on cereal production.</p>	<p>Mr. Ghulam Rasul, Scientific Officer, National Institute of Biotechnology and Genetic Engineering, Faisalabad.</p>	<p>Rs. 2,46,218/-</p>
<p>P-AU/AGR (155). Breeding for seedless kinnow: a biotechnology approach</p>	<p>Dr. Iqrar A. Khan, Associate Professor, Plant Tissue Culture Lab., Department of Horticulture, Univer-sity of Agriculture, Faisalabad.</p>	<p>Rs. 340,598/-</p>
<p>P-AU/AGR(157). Free living nematode Rhabditis as helminth vaccine against Toxocara vitulorum.</p>	<p>Dr. Sikandar Hayat, Chairman, Deptt. of Veterinary Parasitology, Faculty of Veterinary Sciences, University of Agriculture, Faisalabad.</p>	<p>Rs. 6,23,128/-</p>
<p><u>Biological Sciences</u> S-SU/Bio (198). Acrididae of Punjab.</p>	<p>Dr. Mohammad Saeed Wagan, Associate Professor, Deptt. of Zoology, University of Sindh, Jamshoro.</p>	<p>Rs. 3,15,322/-</p>
<p>S-KU/Bio (209). Lipasis: The multifunctional enzyme of microbial origin.</p>	<p>Dr. Nusrat Jamil, Assistant Professor, Deptt. of Microbiology, University of Karachi, Karachi.</p>	<p>Rs. 2,75,502/-</p>
<p>S-AU/Bio (210) Virus free clonal propagation of banana in vitro.</p>	<p>Dr. Mir Mohammad Rajpar Associate Professor, Deptt. of Plant Breeding and Genetic, Sindh Agriculture University Tandojam.</p>	<p>Rs. 3,64,700/-</p>
<p>S-AKU/Bio (217) Effect of bensodiazepines administered to pregnant and lactating rats on the reproductive functions of their offspring.</p>	<p>Dr. Arif Siddiqui, Assistant Professor, Deptt. of Physiology, The Agha Khan University, Medical College, Stadium Road, Karachi.</p>	<p>RS. 3,62,763/-</p>

<p>P-NIBG/Bio (219) Construction of genetically engineered noval cellulolytic yeast strain for single step conversion of biomass production.</p>	<p>Dr. Shoukat Pervaz, Senior Scientific Officer, National Institute for Biotechnology and Genetic Engg., Faisalabad.</p>	<p>Rs. 3,02,325/-</p>
<p>S-KU/BIO (222) Plasmids of indigenous pseudomonads: molecular characterization and gene manipulation.</p>	<p>Dr. Sheikh Ajaz Rasool, Professor, Deptt. of Microbiology, University of Karachi, Karachi.</p>	<p>Rs. 5,27,422/-</p>
<p>C-QU/Bio (225). Studies on hereditary disorders in Pakistani human kirdreds.</p>	<p>Dr. Mahmood Ahmad, Professor, Deptt. of Biological Sciences, Quaid-i-Azam University, Islamabad.</p>	<p>Rs. 60,272/-</p>
<p><u>Chemical Sciences</u> P-CSIR/Chem (219) Process development for manufacture of 6-amino pencillanic acid (6-APA) from pencillin G,</p>	<p>Dr. M.A. Qadeer, Chief Scientific Officer, PCSIR Labs, Complex, Lahore.</p>	<p>Rs. 90,086/-</p>
<p>C-QU/Chem (234). Assessment of air-polluation status of Punjab through vehicular gaseous Pollutants.</p>	<p>Dr. M. Jaffar, Deptt. of Chemistry, Quaid-i-Azam University, Islamabad.</p>	<p>Rs. 2,07,845/-</p>
<p>S-KU/Chem (242). Abiotic conversions of organochlorine pesticides adsorbed on particles under atmospheric conditions.</p>	<p>Dr. Saeedan Begum, Associate Professor Deptt. of Chemistry, University of Karachi, Karachi.</p>	<p>Rs. 2,83,662/-</p>
<p>S-CSIR/Chem (248) Evaluation of aqueous extracts of seaweeds as an elicitor of plant defence mechanisms.</p>	<p>Dr. Mrs. Fatima Bi, Senior Scientific Officer, PCSIR Labs., Karachi.</p>	<p>Rs. 4,19,236/-</p>
<p>C-QU/Chem (256). Synthesis of biologically active organotin derivatives their characterization, and application.</p>	<p>Dr. Saqib Ali, Deptt. of Chemistry, Quaid-i-Azam University, Islamabad.</p>	<p>Rs. 2,18,420/-</p>
<p>CSIR/Chem. (262). Studies on the role of minerals in coronary heart disease (CHD).</p>	<p>Dr.F.H.Shah, PCSIR Labs. Complex, Lahore.</p>	<p>Rs. 3,26,706/-</p>

P-BZU/Chem (266) Determination of post-translational modifications in diabetic lenses	Dr. Riffat Perveen. Deptt. of Chemistry. Bahauddin Zakariya University Multan.	Rs. 3,50,370/-
P-BZU/Envir (29) Effect of industrial effluents on soil and vegetation in and around Multan.	Dr. M. H. Bokhari, Director. Institute of Pure and Applied Biology, Bahauddin Zakariya University, Multan.	Rs. 3,72,645/-
B-BU/Chem. (257). Kinetic study of the reaction of dimeric molybdenum (V) with chloroamine in aqueous medium.	Dr. Abbas Haider Khan, Associate Professor, Institute of Biochemistry, University of Baluchistan, Quetta.	Rs.3,96,402/60
P-CSIR/Chem (267). Production of citrus flavour through tissue culture technology.	Dr. Abdul Satar, Chief Scientific Officer, Applied chemistry Res. Centre, PCSIR Laboratories, Lahore.	Rs. 1,05,590/-
S-SU/Chem (272) Isolation, purification & charactererization of antibacterization of antibacterial antifungal properties of peptides of plants.	Dr. Muhammad Umar Dahot, Assistant Professor, Institute of Chemistry, University of Sindh, Jamshoro.	Rs.3,90,027/60
S-SU/Chem (269) High Resolution NMR studies of chemical shifts and relaxation times in quino line, its various derivatives and some metal complexes formed by its hydroxy quino line derivative.	Dr. A.W.K. Khanzada Professor, National Centre of Excellence in Analytical Chemistry, University of the Sindh, Jamshoro.	Rs. 4,47,943/-
<u>Mathametical Sciences</u> P-PU/Maths (17) Modeling of the Rational quartic Splines for computer Graphics.	Dr. M. Sarfraz, Assistant Professor, Deptt. of Mathematics, University of Punjab, Lahore.	Rs. 3,27,134/-
<u>Physiccal Sciences</u> P-BZU/Phys (84) Physical electrical properties of alkali phosphate glasses.	Dr. M. Ashraf Choudhary, Deptt. of Physics, Bahauddin Zakriya University, Multan.	Rs. 3,67,842/-

C-QU/Phys (90) Studies on anisotropy and vortex motion in melt texture grown superconductors.	DR. S. K. Hasanain, Deptt. of Physics, Quaid-i-Azam Univeristy, Islamabad.	Rs. 4,35,560/-
C-QU/Phys (92) Study of plasma focus discharge.	Dr. M. Zakauallah, Deptt. of Physics, Quaid-i-Azam University, Islamabad.	Rs. 4,11,437/-
PSF/NSFC/RES(6)Phys Particle production and nuclear fragmentation in O10 2532 collisions at 14.6,60 and 600 GeV/	Dr. A. Waheed Khan, Deptt. of Physics, Gomal University, D.I. Khan.	Rs. 6,74,587/-

b. Institutional Support

An amount of Rs. 73,817/- was released to four (4) Institutes/Departments of the Universities and Research Organizations on account of "Institutional Support Grant" for the purchase of chemicals, Glassware and accessories for the major laboratory equipment.

2. Research Evaluation

The Technical/Fiscal Reports received during the report period were evaluated as per procedure laid down by the Foundation for reviewing the progress of PSF Supported Research Projects. The details of these projects are as under.

a) On -Going Projects

Twenty Nine (29) semi-annual reports, received after the initiation of each project or after the submission of the annual reports, were scrutinized by the Research Support Section to assess the interim progress of these projects, and to release their next due installments. The particulars of these reports are as under

Semi Annual Reports:

Project No:	Project Title:	Reports:
F-GU/Agr (107)	Effect of foliar application micronutrient in combination of urea on the yield and fruit quality of sweet oranges.	3rd- Semi-Annual
F-GU/Agr (109)	Utilization of salt effect soils.	3rd-Semi-Annual

F-GU/Agr (113)	Studies on the improvement of physio-chemical characteristic of soils through legume crops in Dera Ismail Khan.	2nd- Semi-Annual
F-GU Agr (116)	Evaluation of early maturing cotton varieties suitable for Dera Ismail Khan Zone.	2nd- Semi-Annual
P-AU/Agr (118)	Studies on etiology and pathology of calf mortality in buffalo and cow neonates.	1st-Semi-Annual
F-AU/Agr (122)	Effect of various doses of potash with and without boron on the yield and quality of sugarbeet in Peshawar valley.	1st-Semi-Annual
P-AU/AGR (128)	Fish as a bioindicator of fresh water contamination by metals.	1st-Semi-Annual
S-AEARC/Agr(131)	Utilization of intraspecific & alien genetic variation for inducing & enhancing salt tolerance in bread wheat.	1st-Semi-Annual
AJK-UCR/Agr(132)	Soil management and alfalfa production in Azad Kashmir.	1st-Semi-Annual
P-AU/Agr (134)	Taxonomic studies on grasshoppers and lacusts (acridoidea: orthoptera) of Pakistan.	1st-Semi-Annual
F-AU/Agr (135)	Genetic variation in the morphological characteristics, chemical composition and ruman digestibility of wheat straw cultivars grown in NWFP.	1st-Semi-Annual
P-NIBG/Agr (136)	Use of rhizobium bio-fertilizer for increasing production of food legumes.	1st-Semi-Annual
F-PU/Bio (177)	Production of medicinally important metabolites by rauwolfia cell cultures.	1st-Semi-Annual
S-KU/Bio (186)	Studies on plasmid associated bacteriocin production by lactobacilli.	1st-Semi-Annual
P-BZU/Bio (189)	Improvement of salt tolerance in sunflower <i>Helianthus annuus</i> .	2nd-Semi-Annual

S-KU/Bio (194)	Studies on mass production of biocontrol agents for application and plant disease control.	2nd-Semi-Annual
S-KU/Bio (200)	Combined Effect of VAM-fungi and rhizobium for increasing growth & yield of soybean.	2nd-Semi-Annual
S-KU/Bio (201)	Ecophysiology of Indus delta mangroves.	2nd-Semi-Annual
P-PU/Bio (204)	Biodegradation of DCP & TCE by tobacco.	1st-Semi-Annual
P-BZU/Bio (211)	Isolation & characterization of cytokinin mutants of <i>Arabidopsis thaliana</i> .	1st-Semi-Annual
P-PU/Chem (183)	Characterization and improved production of xylanolytic enzymes of thermophilic micro-organisms.	2nd-Semi-Annual
P-PU/Chem (208)	Evaluation of trace elements and aerosols in air and their effect on urban environment of Punjab area in Pakistan.	2nd-Semi-Annual
P-PU/Chem (215)	Pharmaceutical investigation on <i>Cannabis sativa</i> L.	1st-Semi-Annual
S-KU/Chem (218)	Microbial transformation (biotransformation) of natural antitumor agents.	1st-Semi-Annual
PMRC/Chem (244)	Study of lipids and apolipoproteins abnormalities in coronary artery disease.	1st-Semi-Annual
C-QU/Phys(68)	Fabrication and characterization of impurity states introduced by diffusion mechanism in semi-conductor materials.	2nd-Semi-Annual
C-QU/Phys (79)	Characterization, modeling and simulation of deim conductor/super-conductor device.	2nd-Semi-Annual
C-QU/Phys (85)	Hard processes in nuclear/particle physics.	1st-Semi-Annual
C-QU/Phys (87)	Characterization of radiation induced defects in semi-conductors.	1st-Semi-Annual

As many as twenty three (23) 1st annual, and six (6) 2nd annual reports in respect of following on-going projects were received by the Foundation, during the report period.

First Annual Reports

Project No.	Project Title
P-VC/Agr (100)	Seroprevalence of various infectious bronchitis virus strains in chickens.
F-GU/AGR (113)	Studies on the improvement of physiochemical characteristic of soils through legume crops in Dera Ismail Khan.
F-AU/Agr (114)	Development of normal and therapeutic diet sheet for Pakistani Population.
F-PU/Agr (115)	Growth pattern and nutritional status of infants and toddlers in North West Frontier Province, Pakistan.
P-AU/Agr (118)	Studies on the aetiology and pathology of calf mortality in buffalo and cow neonates.
F-AU/Agr (120)	Modelling the yield potential and N fertilizer requirements of wheat using soils and weather data for irrigated and dryland areas of NWFP
F-AU/Agr (121)	Fate of nitrogen-15 urea in soil plant system as influenced by nitrification inhibitor.
F-AU/Agr (122)	Effect of various doses of potash with and without boron on the yield and quantity of sugarbeet I Peshawar valley.
F-AU/Agr (123)	Modeling integrated control for maize smuts in the NWFP.
P-NIBGE/AGR (136)	Use of rhizium biofertilizer for increasing production of food legumes.
P-PU/Bio (180)	Management biology of Houbra in Punjab.
P-PU/Bio (187)	Transformation studies of rice (<i>Oryza sativa</i> L.)
C-QU/Bio (192)	Role of follicle stimulate hormone (FSH) on gonad function in the immature monkey: specific and synergistic effects.
S-DU/Bio (194)	Studies on mass production of biocontrol agents for application and

plant disease control.

S-KU/Bio (201)	Ecophysiology of Indus delta mangroves.
S-SU/Chem (200)	Effect of municipal sewerage on the quality of phulali canal water.
P-PU/Chem (215)	Pharmaceutical investigation <i>Cannabis sativa</i> L.
S-KU/Chem (218)	Microbial transformation (biotransformation) of natural antitumor agents.
C-QU/Chem (226)	Synthesis/spectroscopic studies and biological activity of novel heterocyclic compounds having five or seven member ring systems.
P-CSIR/Chem (258)	Production of edible rice bran oil.
C-QU/Phys (68)	Fabrication and characterization of impurity status introduced by diffusion mechanism in semi-conductor materials
C-QU/Phys (69)	Wave propagation and transport phenomenon in controlled fusion.
C-QU/Phys (79)	Characterization, modelling & simulation of semi-conductor device.

2nd Annual Reports.

Project No.	Project Title:
P-NIAB/Agr(97)	Development of short statured varieties of basmati rice.
F-AJ/Agr (107)	Effect of foliar application of micronutrient in combination of urea on the yield and fruit quality of sweet oranges.
F-GU/Agr (109)	Utilization of salt affected soils.
C-QU/Phys (69)	Wave propagation & transport phenomenon in controlled fusion.
S-KU/Phys (72)	Electronic spectra of diatomic molecules.
C-QU/Phys (73)	Weak interactions in a medium and their implication in astrophysics cosmology.

After preliminary scrutiny by the staff of Research Support Section, the above reports were sent for detailed evaluation to the subject experts in the relevant fields. The progress reports alongwith the evaluation reports were then submitted to the respective Technical Committees, for

consideration and acceptance. The remarks of the Technical Committee, if any, were conveyed to the Principal Investigators of the projects, for requisite action.

Grants Released for on going Research Projects:

Research grants totalling to Rs.2.236 million were released on account of various instalments in respect of the on-going projects mentioned as above, after their technical and fiscal evaluation.

b- Completed Projects:

Final report of eleven (11) research projects titled below were received during the year. The reports were evaluated by the subject experts. Subsequently, these reports alongwith reviewer's comments were submitted to the relevant PSF Technical Committees for consideration and adoption.

Final Reports:

Project No.	Project Title:
P-CSIR/Agr (95)	A survey of toxigenic fungi in agricultural commodities.
F-AU/Agr (114)	Clinical evaluation acceptability and impact of normal and therapeutic diets proposed for healthy and sick population on human subjects.
P-PMNH/Bio (150)	Ecological studies of mushrooms and toad stools of Kaghan valley.
S-KU/Bio (170)	Production of medicinally important metabolites by rauwelfia cell cultures.
P-PU/Bio (172)	Termites of desert zones of Pakistan.
AJK-UCR/Bio (178)	Exploratory survey on nodulated wild plants carrying on atmospheric nitrogen fixation in forest area of distt. Pounch (Rawalkot) A.K.
S-KU/Bio (181)	Systematic distribution of the flavonoids in Papilionoideae
S-KU/Chem (205)	Isolation, structure elucidation and biological activity of the chemical constituents of some composite Plants.
S-DRIP/Engg (27)	Developing management model for optimum use of water resources under system constraints.
C-QU/Phys (58)	Preparation and study of the high Tc super conductors.
C-QU/Phys (75)	Numerical/experimental study of Z-Q pinch devices

Meetings of PSF Technical Committees were held during the year. 1993-94 wherein 62 new projects and 34 progress reports of on-going or completed projects were examined in the field of Agricultural, Biological, Chemical, Earth and Physical Sciences. Out of these 36 new projects were recommended for approval, nine were dropped and 17 deferred.

Brief summaries of the work accomplished under the completed projects are given below:

Project No: **P-CSIR/Agr (95)**

Project Title: A survey of toxigenic fungi in agricultural commodities.

Fungal invasion of agriculture commodities may result in marked deterioration in quality and often outright destruction. It is generally facilitated by poor storage conditions at village, commercial and government, high moisture contents of the commodity and favorable temperature conditions.

During this study 302 samples of agricultural commodities and feed ingredients have been examined for microbial contamination strains of *Aspergillus flavus*, *Aspergillus niger* and *Mucor* were present in most of the cases. Presence of strains of *Mucor* and *Rhizopus*: *Mucor* and *Penicillium*: *Alternaria* and *Penicillium fusarium*, *Penicillium* and *Rhizopus* and *Geotrichum* were also detected. Moisture contents of the samples varied from 6.67-14.08 percent. The minimum moisture contents were detected in soya-been meal and maximum in guar meal. As the samples were collected after storage for the initial moisture at the time of purchase/storage could not be ascertained. Some of the poultry feed and feed ingredients were heavily loaded with *Aspergillus flavus* a toxin producing microorganisms, but aflatoxins were erature and moisture during storage or it was not a toxigenic strain or aflatoxins might have appeared had the conditions been favorable.

Presence of aflatoxins in poultry feed, maize gluten, yellow corn, cotton seed cake, sunflower cake and rice polishing has been detected. The percentage of contaminated samples was as high as 80 in case of maize gluten, 69.5 in yellow corn and 67 in sunflower cake. It was 2 and 27% in case of poultry feed and cotton-seed cake samples. Toxin contents were maximum i.e., 350 ppb in maize gluten (40-350 ppb) and minimum in yellow corn (range 20-150 ppb).

During the present project an attempt has been made to ascertain the nature of contaminant of agriculture produce, their toxicity and effects of ingestion of toxic metabolites on morbidity and mortality of poultry and rats. This will help in elaborating likely effects of these toxins on human health and toxic effects, if any, of the decontaminated commodities.

Project No. **F-AU/Agr (114)**

Project Title: Development of normal and therapeutic diet sheet for Pakistani population

In many developed countries numerous diet manuals are available as a guide in the standardization of dietary procedures for hospitals and general population. As these manuals are based on the foods which are used in western countries, therefore they are not of much help in developing countries like Pakistan, where dietary habits, staple food, method of cooking and meal pattern are different than in those countries.

In Pakistan no work has been done to compile balanced and therapeutic diets. Therefore a research project was initiated to develop balanced diet sheet for : (a) normal healthy population, adult female including vulnerable groups e.g. infants, children, pregnant women and elderly male female, (b) Therapeutic diet sheet from locally available Pakistani food for dietary management of various diseases e.g. gastrointestinal infection, obesity, diabetes, gout, liver, kidney, and cardiovascular diseases. Beside these some special diet like low and high fiber diet, restricted proteins, sodium and potassium diet, high fiber, low fat diet, soft textured diet, fat restricted diet, gluten free diet and anti dumping diet have also been prescribed.

For the accuracy of the diet sheets, the protein, energy and carbohydrate value of each diet have been determined practically, and these diet sheets have been developed according to the recommended dietary allowances for healthy persons or the diseased state of an individual with the help of food composition table for Pakistan.

The diet manual include statement concerning basic requirement in health and disease, the principle of diet, food allowance, with detail list of food to use and to avoid with typical meal pattern.

It is anticipated that this diet manual will serve as a guide for researchers, clinicians and general population concerned about their health. It will be a reference material for nurses and dietitians while prescribing a particular diet for hospital patients. It will serve as teaching tool for professional in medical colleges and nutrition departments of universities. It will also be helpful in the improvement of nutritional status of general population and a better management of various diseases in hospitals.

Project No. **PMNH/Bio (150)**
Project Title: Ecological studies on mushrooms and toad-stools of Kaghan.

The Kaghan valley is one the most beautiful places in Pakistan. It extends over about 160 km rising from an elevation of 21,343 meters to its highest point, the Babusar pass at 4150 meter. This valley lies in the North of district Mansehra of Hazara Division and is at its best in the summer months, in May, when the temperature is maximum 10.5°C. The present studies was carried out as preliminary reconnaissance surveys of mushrooms and toad stools of Kaghan valley, with the following objectives:

- Density & Frequency of mushrooms in different climatic zones of Kaghan valley.
- Distribution of mushrooms with respect to soil and climatic factors.
- Ecological amplitude of different mushrooms and explanations.
- Description of one type and salient characters of the group.

During the studies as many as 700 samples of mushrooms and toad stools belonging to 115 general were recorded from Kaghan valley. The valley was divided into 4 ecological zone. The first ecozone namely: Subtropical alpine zone, which includes the area around Balakot and above it. At high attitude this zone is fertile for better collection of mushrooms & toad stools were collected grown as saprophytes in this zone. The 2nd eco-zone is Temperate Trans-Himalayan, comprising sharhan, Shogran, Kamal Ban etc. This zone was found to be rich in wild growing mushrooms. Most of the area of this zone is covered with thick vegetation consisting of conifers, quercus, deodar and other broad leaf trees and bushes. The areas of shogran is best and ecozone at its peak during September and october for all type of mushrooms.

The third is Subalpine Trans-Himalayan comprising of Naran, Saiful Maluk, Lalazar, Batakundi, Burawai etc. In this zone vegetation is sparse, upto Naran it is almost devoid of vegetation except one or two communities of trees. On the way towards Saiful Maluk *Astreus* sp. was collected.

There is good patch of conifers at Lalazar and this area is better than Naran for fungal growth. The subalpine Trans-Himalayan Ecozone for mushroom is comparatively less fertile than the temperate Trans-Himalayan Zone. The fourth zone is the Alpine Trans-Himalayan comprising of Lulusar Lake, Gittidas and upto Babusar pass area. Lulusar lake is the only reservoir for this area. The elevated area of Gittidas was green covered with herbs, the dominate plant are polygonum spp. Rest of the area up to Babusar top was devoid of plants, and lichen were growing on the bare rock. This zone was poor for mushrooms. Only two puff balls were collected from grassy slopes of Gittidas and about five km down towards *Chilas*, there were few communities of Juniper bushes from where characteristic mushroom flora was collected.

All the identified mushrooms were classified after March, 1987. These were enlisted systematically with salient characters of the groups and acute ecological notes, habitat, substrate, distribution and edibility etc. Then environment of some mushrooms were supported with photographs, 32 different species were found to be edible from this valley and 22 were found medically important.

These studies will be beneficial to them who want to study the mushrooms taxonomically or ecologically. The biologists, chemists, biochemists and industrialists will come to know about the mushroom flora of the valley. They can arrange the required material to extract the valuable compounds like anti-tumour, anti-bacterial, anti-viral and anti-protozoal medicine.

Project No. **S-KU/Bio (170)**

Project Title: Plasmids of gram positive cocci as tools for genetic engineering.

The bacteriocinogenic plasmids regulate the synthesis of proteins collectively called bacteriocins that kill closely related bacterial strains which lack in the same type of plasmid. Some related strains resist such an antagonistic action by the bacteriocin because of the immunity.

Thus, for determining the plasmid associated nature of antibiotic resistance and bacteriocinogenic potential, conjugal transferability can be used as a criterion.

During these duties more than 250 gram positive (cocci) indigenous clinical isolates were identified on the basis of morphological, growth (cultural/colonial) biochemical and metabolite production characteristics. Among them 205 belonged to genus staphylococcus: 30 to genus streptococcus and 15 to genus micrococcus. Studies have not only showing to search for the prevalence of antibiotic resistance behaviour among indigenous clinical staphylococci, but successful intergeneric transfer of gentamicin resistant markers of five isolates has even been reported by filter paper mating from *Staphylococcus aureus* to *Klebsiella pneumoniae*. Follow up studies were focused on staphylococcal isolates and 100% of the isolates have offered resistance via one or the other mode of action (viz. by inhibiting protein syntheses, nucleic acid replication or cell wall synthesis). Present findings clearly indicate towards the increasing (absolute) trend of antibiotic resistance (against one or the other antibiotic). The antibiotic used for screening included ampicillin, cephadrine, erythromycin, gentamicin, neomycin, polymixin-B, streptomycin and tetracycline. Resistance to polymixin-B has been found to be the most common (78%), however, tetracycline resistance has been found to be the least.

A few bacteriocin producing (7%) strains of staphylococci have also been instaled. However, these bacteriocins were only effective against closely related strains. It is interesting that almost all the bacteriocinogenic strains lost this property after curing: thereby indicating the bacteriocin regulation by plasmid-borne genes in Gram positive cocci in general.

As a result of this study the natural broad-host rang staphylococcal plasmids have been reported for the first time in Pakistan. We may speculate that Gram positive veplasmids (With particular reference to staph. aureus) carry a still broader host-rang trend of transmissibility and expression potential and thus, may prove to be the better shuttle vectors for genetic engineering technologies.

Project No. **P-PU/Bio (172)**

Project Title: Termites of desert zone of Pakistan

During this project a total number of 575 trees were examined in a quadrate of three kilometer length x 10 m width at minor Chak No. 115/6.R. Only ten trees belonging to *Dalbergia sissoo* were harbouring termites. *Coptotermes hemi* infested six trees whereas *M. mycophagus* infested four trees of *Dalbergia sissoo*.

Near Kakra canal in a quadrate of 3 kilometer length xx 10m width, 361 trees were examined for termites. Seventy-five trees belonging to *Acacia arabica* were found infested with termites and only one species (*Amitermes belli*) was collected from these plants.

The data collected has shown that the number of colonies collected from trees growing in a pocket of desert ecosystem and from sandy soil. Maximum number of colonies belonged to *Mycophaus*. This desert termite can infest living trees and can also nest in sandy soil from where 18 colonies of this termite were collected by soil cores. *E. paradoxalis* was collected only once

in this sampled area and only from the sandy soil. As regards *O.guptai* three colonies were collected from trees and two from sandy soil: *Psammotermes rajasthanicus*: coptoterms. A total of 360 colonies of termites were collected from Bahawalpur and Bahawalnagar. Out of these, 30 colonies of termites were collected from Bahawalpur and 330 from Bahawalnagar. This difference is because of the fact that the later locality has been surveyed more thoroughly than three former. But one thing, irrespective of sample size is common to both the localities, i.e. *Microtermes mycophagus* is more abundant in both the localities, and constitutes the dominant element of the composition of the desert termite fauna of the two localities surveyed. The second abundant termite is *Eromotermes paradoxalis*. This species also likes sandy soil for its nesting system.

A total of 88 termite colonies representing *M. obesi*, *M. mycophagus* *O. guptai*, and *Eronotermes paradxali*, were collected from agricultural fields in the sampled area. Sixty seven colonies of termites were collected from Bahawanagar and twenty one from Bahawalpur, and the termites were foraging in the cotton, wheat and sugarcane fields. At Bahawalnagar the number of termite colonies collected from cotton, wheat and sugacane were 24, 30 and 13, respectively. At Bahawalpur only one colony of termites was collected from cotton fields and 20 from wheat fields when fields at Bahawalpur were examined during 1991, cotton was near harvesting stage and only one colony was recovered through cores.

Project No. AJK-UCR/Bio (178)

Project Title: Exploratory survey of nodulated wild plants carrying atmospheric nitrogen fixation in forest area of Poonch (Rawalakot) A.J.K.

The present work pertains to an important field in Biological Sciences specially useful to crop nutrition with regards to nitrogen enrichment of cultivable fields through the use of phenomenon popularly known as BNF (biological nitrogen fixation). There are many facets of BNF. The most common is that one where leguminous crop plants are used in a crop rotation, the best example being certain pulse crops such as gram lentil, etc. and many fodder crops such as Lucerne, alfalfa, etc.

There are some non-legume plants which can also carry on nitrogen fixation due to activities of some special microorganism called actinomycetes in the root nodules of these plants. These plants unlike legumes are shrubs or small trees, and there have been tried successful in the forest areas of Azad Kashmir. It is considered that application of fertilizers can be replaced by associating fruit plants with such a shrub which can enrich the soil with nitrogen and thus the fruit plant can yield high productivity.

As a result of these studies some such microorganisms have been isolated successfully and are under investigation for their effective use as a tool of BNF.

Project No. S-KU/Bio (181)

Project Title: Systematic distribution of flavonoids in papilionoideae (Leguminosae).

Flavonoids were investigated in members of subfamily papilionoideae from Pakistan. Total number of 5 genera with 25 species were analysed in the present investigation. The genera *Crotalar*, *Indigofera*, *Medicago*, *Melilotus* and *Tephrosia* were studied from the leaf samples by paper and thin layer chromatographic techniques. The total number of 55 flavonoids were tentatively identified by using authentic markers, Rf-values as reported in literature, UV-Fluorescence and color reactions with spray reagent. Some of the compounds could not be identified. A number of species have been confirmed for Quercetin, Luteolin, Myricetin, Apigenin, Tricin, Acacetin, Rutin, Qu.3.Gel., pelargonidin & Malvidin on the basis of UV-spectral properties using various shift reagents.

Plants have been analysed for interplant and inter-locality chemical differences and relationships etc. This has revealed the geographical, environmental and ecological stability of the compounds, clearly indicating that this approach is significant for taxonomic judgments. As the results are found to be highly significant in the study of classification of plants with reference to flavonoids, therefore some more genera and species need to be studied, so that the chemical information of flavonoids can be more extensively used in plant classification.

Project No. **S-KU/Chem (205)**

Project Title: Isolation, structure elucidation and biological activity of the chemical constituents of some composite plants.

One thousand genera of the family composites are known in the world. The plants of this family are easily identified by their characteristic capitulum influences and hairy papus. This family includes the tribe inuleae, composed of 50 species distributed in the tropical and subtropical regions of the world, out of which 7 species are found in Pakistan. *Pluchea* plants are usually shrubs, or under shrubs, rarely herbs, often weedy below, pubescent or tomentose. Four plants of the family composite were selected for detailed investigation of their chemical constituents due to their medicinal properties, which are as under:

- i) *Pluchea arguta*, Boiss. is commonly found as a shrub on the sandy plains of Pakistan. It has many branches, are glandular, pubescent with offensive smell and up to about 50 cm tall the leaves are abbot-oblong or oblanceolate, actually serrate or dentate, 2.5-5.0cm long 2.5-22 m broad. The bluish or pinkish, heads, are 8-12 mm papus hairs are shortly barbellate. Leaves of *Pluchea indica* are a remedy of leucorrhoea. *Pluchea sagittarius*, Lam *cabreea*, is used in folk medicine due to its tonic and digestive properties. No medicinal work on the *pluchea arguta* has been reported so far. During the present project some medicinal properties of this plant have been worked out.
- ii) *Inula grantioides*, Boiss is a shrubby perennial plant, 15-60 cm tall, glandular with hairy, fleshy leaves variable lobed, flowers are yellow in colour. Its local name is Nzto (Lasella) or kolmir. It is found in Southern Pakistan, Karachi (Sindh), Kutch, Indus Delta and Baluchistan. *Inula grantioides* is reported to be used for asthma. The essential oil has very strong antibiotic properties and found to be highly poisonous. *Drosophila*, silverfish, ants and mosquitoes when introduced in oil vapours die almost instantaneously. The local people

keep the flowers and twigs alongwith their cloths to be preserved for a long time. The chloroform extract of leaves stems and flowers showed antibiotic properties upon the gram positive bacteria.

- iii) *Exlypta prostrate* is found in places by ditches etc. It is found in Karachi (Sindh), lower Baluchistan, Peshawar, Kohat and common in Punjab plains.
- iv) It is a small, hirsute, erect or suberect annual herb, sometimes rooting at the nodes upto 60 cm tall but usually much smaller, leaves opposite. Its local name is Dodhek. The plant has hasemitic action. It is recomended in jaundice, fever, good for eyes, enlarged liver, spleen and dropsy.
- v) *P. Lanceolate* is an erect pubescent shrub, the leaves are 2.5-6.0 cm by 5-12 mm, oblong , thick, obtuse and apiculate. Its local name is Resham. The leaves of *P.lanceolata* Olive. and Hiern, are used as substitute or adulterant for senna. This plant is also used in Ayurvedic system of medicine in various chemical conditions. It is used as a bitter, laxative, an analgesic and a antipoyretic and a nerve toxic.
- vi) As a result of this study grantioidinin-8, a novel flavone, alongwith four known compounds have been isolated as a new source viz. tocopheolquinone, pluchidione, pectolinarigenice and salvigenin. Four more compounds have also been isolated in smal quantities. Attempts are now being made to isolate them in larger quantities.

Project No: **S-DRIP/Engg (27)**

Project Title: **Developing Management Model for Optimum use of water resources under system constraints.**

Under the present project sprinkler irrigation system, designed and fabricated from local material and installed on about one acre of land at DRIP campus. Wheat in Rabi and Cotton in Kharif season have been tested for three years. The results obtained from the study were encourgaing as higher water use efficeincy was noted in both the crops in sprinkler over conventional method. In addition, in cotton and wheat about 27% and 30% water saving was achieved over conventional method respectively. All the components of this system showed satisfactory performance during the study period.

Per acre capaital costs of trickle for vegetable growing and sprinkler irrigation systems have been worked out as Rs. 75,000/- and Rs. 57,000/- respectively. These costs are very high and are big constraints against the adoption of these systems in irrigated areas. However, these could be beneficial for water scace and uncommnaded canal areas provided the groundwater quality is within permissible limits for the crops grown. Anyhow, more research is required to bring down the capital costs of trickle and sprinkler irrigation systems, to an economical level. From this study the following objectives have been levelled.

- The RCC pipe water carrier installed for irrigation purpose at DRIP campus is performing satisfactory as planned.
- The pipe water carrier has reduced seepage and other water losses very significantly with respect to the open channel. Thus, about 21% water saving has been achieved.
- By installing pipe water carrier, weed emergence problem and maintenance labour cost has been controlled totally.
- In place of earthen water channel if pipe system is installed, about 30% of land could be saved as earthen water channels occupy more area in comparison to pipe system,.
- Trickle and sprinkler irrigation methods are capable to save water up to about 64 and 30% by growing vegetables and cotton and wheat respectively over furrow and flood irrigation methods.
- High water use efficiency was achieved in trickle and sprinkler irrigation methods in all the Kharif and Rabi vegetables and in wheat and cotton respectively as compared to furrow and conventional irrigation methods.
- As in trickle irrigation method the water is applied to plant root zone only and surrounding area remains dry, therefore the problem of weed emergency is minimized.
- Since trickle and sprinkler irrigation methods do not need full land levelling, buns and channels therefore labour is saved and these methods could be adopted even in hilly terrains.
- Under trickle irrigation system the salts were not deposited in wetted zone. However, salt deposition was observed at wetted periphery which needed to be leached down below the root zone.
- The capital cost of trickle and sprinkler irrigation systems as worked out was very high. Thus, these may not be feasible and economical for the irrigated areas but, these could be beneficial for water scarce and uncommanded canal areas. However, further more research is required to bring down the capital costs of these systems to a justified economical level.

Project No: **C-QU/Phys (58)**

Project Title: **Preparation and study of high T_c superconductors.**

This project has been directed towards investigations on the preparation and study of the new high temperature superconductors. Various types of superconducting materials (e.g. Yttrium and Bismuth based) were prepared under a variety of conditions and finally a suitable (Melt-Textured-Growth) process has been identified as the method which delivered the best quality samples. The samples were characterized according to their critical temperatures, magnetization behaviour, and transport properties under varying conditions of magnetic fields and currents. In these studies most of which are the first of their kind in Pakistan, the important parameters which limit the ability of these materials to carry large current and to withstand high magnetic fields have been identified. It was determined that grain boundaries and absence of directional order in polycrystalline materials are the major drawbacks. The melt textured superconductors prepared with provided very good intergrain contacts, large grains and well defined directionality. The last feature, viz. directionality enabled to study the unique two dimensional

behaviour. A number of interesting and important features were observed in the anisotropy of their magnetic responses, which also illustrate the complexity of their behaviour.

Measurements of magnetization changes with time, were performed which yielded further insight into the dynamical behaviour of these materials, and the role of defects in enhancing critical currents. The results obtained during the period of this project have been published internationally in the form of Eleven (11) research publications. Additionally, they were presented in both local and international conferences and seminars. Seven experimental and two theoretical M.Phil. These were completed on various aspects of this problem. Two experimental Ph.D theses are nearing completion. The principal Investigator was awarded the Dr.A.Salam prize in physics for 1989 on the basis of some of the work done in this project.

These studies have an important bearing on our ability to understand the electrodynamics of the new high temperature superconductors, so as to enable their applications. Large critical currents, high critical fields and temperatures are the parameters which are cubical to the fabrication of superconducting wires and hence to the fabrication of superconducting magnets.

Project No. **C-QU/Phys (75)**

Project Title: Numerical/Experimental Study of Z-Q Pinch Device.

There are several uses of the Z-pinch device, e.g. It can produce ultra high magnetic fields (>40 MG) through fast compression of initially weak fields by the imploding plasma 2-4. It can also be used as X-ray source and is proposed as a potential device for X-ray lasers 5-7 which in turn can be used as a driver for ICF (Inertial Confinement Fusion). The Z-pinch device is also suitable for plasma diagnostic studies and spectroscopic measurements.

In the present study the feasibility of using Z-0 pinch device as an intense source of X-rays has been carried out. The capacitors bank for the Helmholtz coil has been designed and developed. A pressurised spark gap has also been designed locally. The transformer and other components for the power supply have been purchased and the autocontrol circuit has been designed and completed locally. A huge platform and most parts of the vacuum system have been fabricated locally, these parts include the sophisticated fast gas puff valve. The design of the vacuum chamber of stainless steel has been completed and the machining/fabrication is in progress. The theoretical work proposed for this project is in progress. Interesting results have been obtained by modifying the codes of earlier workers. After analysis, these results have been published in an international journal for publication. The modification has been made to stimulate the experimental conditions of plasmas expected to be generated in our Q-Z pinch device.

3. Scientific Societies/ Learned Bodies

Foundation is awarding annual grants to the established learned bodies and scientific societies, as partial financial assistance for the achievement of their approved objectives and publication of their scientific journals. Annual grants amounting to Rs.0.590 million were released to 15 Societies and nine journals as enlisted below.

a) Societies:

Name of Society:	Amount of Grant
Pakistan Academy of Sciences	Rs.1,00,000/-
Pakistan Association of Scientists & Scientific Professions	Rs. 30,000/-
Scientific Society of Pakistan	Rs. 50,000/-
Pakistan Association for the Advancement of Sciences	Rs. 50,000/-
Pakistan Medical Association	Rs. 15,000/-
Zoological Society of Pakistan	Rs. 30,000/-
Pakistan Botanical Society	Rs. 25,000/-
Biological Society of Pakistan	Rs. 25,000/-
Pakistan Society of Biochemists.	Rs. 15,000/-
Chemical Society of Pakistan.	Rs. 30,000/-
Institute of Electrical Engineers.	Rs. 20,000/-
Institute of Engineers, Pakistan	Rs. 20,000/-
Pakistan Society of Nematologists.	Rs. 10,000/-
Pakistan Physical Society	Rs. 20,000/-
Pakistan Thalesmia Welfare Society	Rs. 20,000/-

b) Journals:

Name of Journal	Amount of Grant
Journal of Pharmaceutical Science	Rs. 10,000/-
Journal of Science, Technology and Development	Rs. 20,000/-
Mehran University Research Journal	Rs. 10,000/-
Pakistan Journal of Forestry	Rs. 10,000/-
Pakistan Oral & Dental Journal	Rs. 10,000/-
Journal of Natural Science and Mathematics	Rs. 10,000/-
Pakistan Veterinary Journal	Rs. 20,000/-
Journal of Pharmacology	Rs. 20,000/-
Pakistan Journal of Marine Sciences	Rs. 20,000/-

Mr. Muhammad Javed, Deptt. of Soil Ph.D fellowship Rs. 36,000/-
Sciences, University of Agriculture,
Faisalabad.

Mrs. Sanjeeda Khatoon, Associate Partial financial assistance Rs. 20,000/-
Curator, Zoological Sciences Division, for PH.D. studies.
PMNH, Islamabad.

7. Scientists Pool

In order to assist in the proper utilization of highly qualified scientific manpower, the Foundation has established a "Scientists Pool". The scientists and engineers returning after advanced training in foreign countries are appointed on PSF Scientists Pool provided they are successful in obtaining a research and teaching assignment in any University or a Research Institute. As Scientists Pool Officer, they are paid subsistence allowance @ Rs.4000/- p.m. for a period of six months extendable to one year. Under this program following five scientists were appointed on the pool:

Name of Scientist	Institution
Dr. Irfan Michael Roy,	National Institute of Health, Islamabad.
Dr. Safia Ahmed,	Dept. of Biological Sciences, Quaid-i-Azam University, Islamabad.
Dr. Akram Shah,	Institute of Prosthetic and Orthotic Sciences (PETCOT) University of Peshawar.
Dr. Asghar Ali,	Pakistan Museum of Natural History, Islamabad.
Dr. Zulfiqar Ali,	National Center of Excellence in Geology, University of Peshawar.

8. International Liaison

Pakistan Science Foundation hosted the visit of 18-member Chinese Appropriate Technology Mission, under 12th. S&T protocol between Governments of China and Pakistan. The mission visited Pakistan for participation in the 2nd. National S &T Fair organized by the Pakistan Science Foundation from January 22 to February 6, 1994. They exhibited products based on Scientific & Technological Research from respective Chinese organizations in the Fair. Besides participation in the Fair, their visits were arranged by PSF to the following S&T organizations located in Islamabad.

- Pakistan Meteorology Department.
- National Physical and Standard Laboratories (NPSL)

- Pakistan Council of Research in Water Resources (PCRWR).
- Oil and Gas Development Corporation (OGDC).
- Pakistan Scientific and Technological Information Centre (PASTIC)

9. Planning And Development Program

Development Projects

In the PSDP 1993-94 an allocation of Rs. 14.761 million was made for four on-going development projects of PSF, PMNH and PASTIC as detailed below, which was subsequently reduced to Rs.10.819 million by imposing 27% economy cut. However, an amount of Rs. 8.913 million was released against the allocation for the following projects:

- Construction of Pakistan Science Foundation Building.
- Establishment of Pakistan Museum of Natural History, Islamabad.
- Strengthening of PASTIC National Science Reference Library, Islamabad.
- Setting up Database Facilities at PASTIC Islamabad.

The construction of PSF building at Science Complex, Islamabad, initiated in February 1993, continued during 1993-94. As the PC-I was initially approved in 1988. The funds, however, were allocated in PSDP 1992-93, which necessitated revision of project due to cost escalation. Accordingly, the PC-I was revised and submitted for government approval which was approved in December 1993 at a total cost of Rs.16.824 million.

During the report period, 70% of the civil work was completed. It is expected that the project will be completed during the stipulated period of two years i.e. by February, 1995. The progress of PMNH & PASTIC projects is given separately in their reports.

B. SCIENCE POPULARIZATION SECTION

The activities of Pakistan Science Foundation for promotion and popularization of science through various programmes continued during the year 1993-94. A summary of these programmes is given below:-

1. Funding For Conference/Symposia/Seminars Etc.

The Foundation provided financial assistance for National and International Science Conferences, Seminars, Symposia, Workshops etc. held in Pakistan. During the report period an amount of Rs. 0.502 million was given to the following scientific organizations/institutions for organizing such events:

Events	Organizing Agency	Amount Released
Seminar on Petroleum Exploration Potential of Lower Indus Basin	Department of Geology, University of Karachi.	Rs. 20, 000/-
International Conference on Asia	West Asian Studies, 109 Faculty of Arts University of Karachi.	RS. 20, 000/
International Symposium on Bio-technology for Sustainable Development	National Institute for Bio-technology & Genetic Engineering Faisalabad.	Rs. 20, 000/-
National Symposium on Parasitology	Department of Zoology, University of Sindh, Jamshoro	Rs. 25, 000/-
National Conference on Education	University of Sindh, Jamshoro.	Rs. 20, 000/-
Second all Pakistan Prof. A. L. Shaikh intervarsity Software Competition and Exhibition	Institute of Mathematics and Computer Sciences, University of Sindh, Jamshoro.	Rs. 30, 000/-
Fourth National Weed Science Conference	Department of Agronomy, University of Agriculture, Faisalabad.	Rs. 20, 000/-
3rd National Conference of Plant Tissue Culture.	Dept. of Botany, University of Peshawar	Rs. 25,000/-
International Symposium on High salt Tolerant Plant.	Dept. of Botany, University of Karachi.	Rs. 25, 000/-
5th National Chemistry Conference.	Dept. of Chemistry, Quaid-i-Azam University, Islamabad.	Rs. 25,000/-
6th Regional Conference in Mathematical Physics.	Dept. of Physics Quaid-i-Azam University, Islamabad.	Rs. 25,000/-
3rd Pakistan Geological Conference Lahore	Institute of Geology, University of the Punjab, Lahore.	Rs. 20,000/-
19th IUPAC Symposium on the Chemistry of Natural Products	H.E.J. Research Institute of Chemistry, University of Karachi.	Rs. 40,000/-

10th Training Course on the use of Nuclear and other Advance Techniques.	Nuclear Institute for Food and Agriculture Tarnab, Peshawar.	Rs. 15,000/-
International Symposium on Environmental Assessment and Management of Irrigation Drainage projects for Sustained Agriculture Growth.	Centre of Excellence in Water Resources, University of Engineering & Technology, Lahore.	Rs. 20,000/-
Sixth all Pakistan Geographical Conference.	Deptt. of Geography Islamia University, Bughdad-ul-Jadid Campus, Bahawalpur.	Rs. 20,000/-
Software Display in IUPAC Symposium.	H.E.J. Research Institute of Chemistry, University of Karachi.	Rs. 10,000/-
17th (XVII) National Conference of Pakistan Pathologists, Rawalpindi	Armed Forces Institute of Pathology, Rawalpindi	Rs. 35,000/-
National Workshop on Poultry Disease Prevention & Control.	Poultry Development Centre (P.R.I) Murree Road, Shamsabad, Rawalpindi.	Rs. 25,000/-
Workshop in Atomic Structure and Quantum Theory.	National Centre of Excellence in Physical Chemistry, University of Peshawar, Peshawar.	Rs. 20,000/-
National Workshop on Veterinary Education & Research	Deptt. of Physiology, University of Agriculture, Faisalabad.	Rs. 30,000/-
14th Pakistan Congress of Zoology	Deptt. of Zoology, University of the Punjab Lahore, Pakistan.	Rs. 20,000/-
Kashmir Scientific Cultural & Industrial Exhibition-93	Kashmir Society of Scientific & Social Research, Muzaffarabad A.J.K.	RS. 25,000/-
National Science Fair	Board of Intermediate and Secondary Education, Hyderabad.	Rs. 40,000/-
Science Day 93 Holding of Science Quiz & Science Model Competition	National Museum of Science & Technology, Lahore.	Rs. 82,000/-

2. Organization Of Science Exhibition/ Fairs

a. National Science & Technology Fair-1994.

Pakistan Science Foundation organized the 2nd National Science & Technology Fair at the Pakistan sports complex w.e.f 22nd January, 1994, The Fair was inaugurated by Syed Yousaf Raza Gillani, Speaker, National Assembly Pakistan. The honorable Chief Guest visited each stall. This year, sixty four (64) different scientific/technological institutions, public/private sector. organizations, NGOs participated in the Fair. Besides, People Republic of China's National Commission on Science & Technology sent thirteen (13) institutions for participation.

The prime objective of the Fair was to

- Increase public awareness about the scientific and technological developments made in Pakistan.
- To acquaint them with local research findings, scientific achievements and advancement of technology.
- Also to provide a common platform for interaction between R&D educational institutes, entrepreneurs in private/public sector, to play a catalytic role in utilization and development of technology for upgradation of the products.

The fair concluded on February 6, 1994. H.E. Sardar Farooq Ahmed Khan Leghari, President, Islamic Republic of Pakistan presided over the award ceremony,. The honorable Chief Guest also visited the fair alongwith Sardar Talib Hassan, Parliamentary Secretary for Science & Technology, Secretary Ministry of Science and Technology and Chairman, PSF. The efforts of the Foundation were highly appreciated.

The fair contained several special and important events like symposium, aero modeling, art competition, essay competition, quiz competition, walk for science, exhibition of scientific innovations made by colleges/schools. These events played important role in enhancing the participation and entertainment of visitors.

b) S & T Expo -93

Pakistan Science Foundation organized Science & Technology EXPO-93 during the 6th meeting of the OIC Ministerial Standing Committee on Scientific and Technological Co-operation (COMSTECH) held from Sept. 21-25, 1993 at Pakistan Engineering Council Building, Islamabad.

The President of Pakistan inaugurated the exposition. Besides the general public and students, the distinguished delegates from OIC countries attending the COMSTECH meeting, visited the exposition and showed keen interest in the exhibits of scientific and technological developments made in Pakistan.

3. Popular Science Lectures

Two popular lectures were organized by the Foundation which were attended by the eminent scientists, technologists, educationists and students etc. The names of speakers and topics are as below;

Name of speaker	Topic of Lecture
Mr. Daniel Blumstein Zoology Department University of California, U.S.A	Wildlife Conservation and Development in Khunjrab National Park.
Dr. S.R.H. Baqri, Director, Earth Science Division, PMNH.	Distribution of Sulpher in the Coals of the Dandot and Sindh Coal Fields of Pakistan.

4. Science Film/Planetarium Shows

a. Science Film Shows.

Foundation continued screening film shows in schools of Islamabad, Rawalpindi. These shows provide scientific information on stars, planets, galaxies etc. A total number of 148 shows including 66 shows at Rawalpindi schools were arranged during the period under report.

b. Planetarium Shows

A total number 143 shows were arranged during the period under report including 64 shows at Rawalpindi. Planetarium shows also attracted the attention of students and other public at S& T Fair 1994.

5. Distribution of Scientific Books and Magazines

The PSF regularly publishes, acquires and Scientific booklets/leaflets and distributes to education and scientific institutes. Following books have been distributed during the period under report;

1. The book entitled "The Girl Child" has been distributed to the libraries of medical colleges, women colleges, home economics colleges etc.
2. Some 100 copies of the book entitled 'HPLC' (High Performance Liquid Chromatography) have been distributed to various educational institutions.
3. Two hundred copies "Science Digest" were acquired and distributed to various schools in the country.

4. Leaflets on Almond, Sorghum and Snakes were also published and circulated among students and general public.

In addition , the 5th issue of “Science Bulletin” was published and distributed to science clubs and various R&D organisation.

6. Science Clubs Program

In connection with free distribution of literature on scientific themes, three new leaf-lets were printed in urdu and are being distributed among members of Science Clubs, free of cost. Proformae were also sent to the participating members of the Science Club programme (phase I & II) for inviting their activity reports, achievements, suggestions and comments.

Donation of equipment:

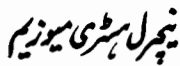
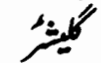
Pakistan Science Foundation provides literature on different scientific themes to the member schools of science clubs programme. These literature consists of useful collection of scientific knowledge regarding plants, animals, galaxies materials etc.

Colorimeters are instruments with which we can perform different interesting experiments of Chemistry and Biology. A total of 378 colorimeters were purchased, these colorimeters accompanied with glassware and chemicals, alongwith a booklet containing different projects for performing experiments. The Board of Intermediate & Secondary Education of Pakistan were requested to assist us in securing at least 24 schools from their jurisdiction for supply of these colorimeters. Good response has been received from all the Boards and the colorimeters are being distributed to all nominated school. It was also emphasized that only those schools be selected who have science education and qualified science teachers to handle the equipment. During the report period, 84 colorimeters have been sent to the following boards:-

- Peshawar 24
- Swat 12
- Bannu 24
- D.I.Khan 06
- Rawalpindi 24
- Islamabad 24

7. Science Posters Project

The 7th set of science posters comprising of the following were printed & distributed to more than 7000 High Schools in the country.

1. 
2. 

3. ٹیلی وژن
4. روئیدگی
5. آبی پودے
6. واشنگ مشین
7. ہڈی
8. رکاز

9. Portrait of Muslim Scientist- Abu Hamid al-Ghazali
10. Portrait of Muslim scientist- Abu al-Qasim al-Zahravi

8. Inter Board Science Posters Contest

Science Posters Contests are a regular activity of PSF. The 7th Inter Board Science Posters contest on the theme "Environmental Pollution and Human Health" was organised during the year. From all over the country, 13 Boards of Intermediate and Secondary Education participated. The winners were awarded prizes worth Rs. 26,000/-.

9. Intra Board Science Essay Competition

The 6th Intra Board Science Essay Competition has been successfully completed. In all, students from 11 Boards of Intermediate & Secondary Education participated & prize money has been awarded to the prize winning students.

10. Science Caravan Activities

Science Caravan Units for Federal Area, NWFP and Sindh province continued to arrange their caravan exhibition in various schools within their province

Federal Unit:	i	Gordon College, Rawalpindi	Dec.9-16, 1993
	ii	National Science & Technology Fair.	Jan 26- Feb 6, 1994
NWFP Unit:	i	Telecom Boys Public School, T&T Colony, Haripur.	Oct 23-26, 1993
	ii	Govt. High School, A.C Centre, Nowshera	Dec 8-15, 1993
	iii	National Science & Technology Fair, Islamabad.	Jan 26- Feb 6, 1994
Sindh Unit.	i	National Science & Technology Fair, BISE, Hyderabad.	Dec.17-21, 1993
	ii	Pano Aqil	Dec.13-16, 1993
	iii	Pano Aqil	Jan.8-24, 1994

PAKISTAN MUSEUM OF NATURAL HISTORY (PMNH)

Both research and public service activities continued in earnest during the year under review. PMNH was able to add as many as 3080 specimens of plants, animals, minerals and fossils etc. to its collection. These collection were made during 27 field trips undertaken by the three Science Divisions of the Museum. This material, alongwith other material already collected, was thoroughly researched upon. Based on this research, as many as 19 research articles were published in scientific journals of international repute, including 10 in foreign journals.

Interaction between PMNH scientists and many foreign organizations also continued. The PMNH-Tokyo Museum interaction regarding Cryptogamic flora of Pakistan was concluded and a 2nd volume of "Cryptogamic Flora of Pakistan" was published. The collaborative work between PMNH and Florida State Museum, on small mammals of Pakistan also continued for its second year, while a new research collaborative programme between PMNH and Oxford University was initiated.

PMNH was also fortunate in receiving back three of its personnel after their having obtained advanced degrees from foreign countries including France, Germany and Malaysia.

The Museum remained busy in planning its impending shift to its new building which is scheduled to be completed to an extent which will facilitate the shifting of its Science Divisions.

A brief resume of the activities of various Divisions of Pakistan Museum of Natural History during the report period is as follows:

1. BOTANICAL SCIENCES DIVISION (BSD):

a) Reference Collection:

A total of 12 field trips were carried out to Attock, Peshawar, Swat, Banni Forest, Orakzai agency, Palas Valley, Kohistan, Naran, Kaghan and Galiat. Collected 1160 higher plant specimens, 165 mycological specimens, 50 algal specimen bottles and 10 soil samples.

b) Laboratory Work:

Preservation, mounting and labelling of 1160 higher and 215 lower plants was done. Identification of 950 higher and 150 lower plants was done.

c) Research Work:

i) Projects Completed/in Progress:

Audit report for the project "Ecological studies of Mushrooms and Toad stools of Kaghan Valley" was submitted to Pakistan Science Foundation.

Prepared and submitted report on "The Studies on Quercus sp". The project was completed in collaboration with an Italian team of botanists.

Also completed the report on "Plant collection in Palas Valley, Kohistan Expedition".

Preparation of manuscript on "Cryptogamic Flora of Pakistan, Part III" is in progress with the collaboration of Japanese counterparts.

d) Extension work and Services Rendered to other Organizations:

Collaboration with Dr. Nakaike, Prof. Tokyo University, Japan, regarding publication of a book is in progress.

Identified 400 higher plant specimens and 80 mycological specimens for the students of Muzaffarabad and Quaid-i-Azam Universities.

e) Publications:

Saleem Ahmad (1992). Quantitative studies on the weeds of wheat field of Rawat area, Islamabad. Pak. J. Sci. Ind. Res. 36(1): 631-34.

Awan, M.R., B.K. Niazi and Z. Khattak (1992). Impact of soil on the vegetation in Islamabad and Rawalpindi area. Pak. J. Agric. vol.13(4): 368-372.

Nakaike, T. and S. Malik (eds.) (1993). Cryptogamic Flora of Pakistan, Vol.II. Nat. Sci. Mus. Tokyo, Japan.

Nakaike, T. and S. Malik (1993). A list of pteridophytes collected from Pakistan. In Cryptogamic Flora of Pakistan. vol.III: 317-357.

Haga, M. and M.K. Leghari (1993). Hydrurus foetidus (villares) Trevisan from mountain streams in Pakistan and Nepal. Crypt. Fl. Pak. vol.II: 1-11.

Leghari, M.K. and K. Sultana (1993). A list of diatoms of Malka Parbat, Kaghan, Pakistan. Crypt. Fl. Pak. vol.II: 13-18.

Yamamoto, Y. H. Haginara and K. Sultana (1993). Myxomycetes from Northern Pakistan II. Cry. Fl. Pak. vol.II: 25-41.

Awan, M. R. and F. Bano (1993). Status, Management and Benefits of Mangroves of Pakistan PCST Journ. vol.II No.3: 131-133.

Shah, M. and Wilcock, C.C. (1993). Intrageneric classification of the genus Potentilla L. (Rosaceae) in Pakistan and Kashmir. Edin. J. Bot. 50(2): 173-179.

Shah, M., S. Ahmad and F. Bano (1994). The genus Sibbaldia L. (Rosaceae) in Northern Pakistan. Bull. Nat. Sci. Mus. Ser. 13 30(1): 33-35.

Shah, M. and F. Bano (1994). Two new records of Potentilla and Sibbaldia from Pakistan. Sci. Khyber vol.7(2): 99-102.

2. EARTH SCIENCES DIVISION:

a) Reference Collection:

As many as 6 field trips were extended to Salt Range, Chakwal, Yasin and Ashkaman Valleys, Gilgit Agency etc. As a result 300 invertebrate fossils, 400 rock/mineral samples were collected.

b) Laboratory Work:

Catalogued 400 rocks/minerals and 300 fossils. Petrographic studies of 120 rock samples were made. Prepared thin sections of 115 samples. Washed 20 bags of sediments for the recovery of small fossils.

Analysed and identified 51 rocks and 135 fossils respectively

c) Research Work:

i) Projects completed/in progress:

Finalized biannual report on the project entitled "Mineralization and Petrology of the Main Karakorum Thrust in Chitral and Gilgit areas".

Prepared report on the project "Minerology and Petrology of Swat District".

Prepared technical report on the geological samples collected from Eastern Salt Range.

ii. Projects proposed/submitted:

Stratigraphic importance of Some Permian Rocks.

d) Extension work and Services Rendered to other Organizations:

Identified 30 rock/mineral samples for college students.

Collaboration with Dr. S. M. Raza, Deputy Secretary, GSP, Islamabad in compilation of manuscript entitled "Bibliography of small mammal fossils of Pakistan" is in progress.

A collaborative research project with Dr. M.N. Chaudhary, Punjab University on "Minerology and Petrology of Swat" is being finalized.

e) Publications:

Hussain, S. S., M. N. Chaudhary and H. Dawood (1993). Emerald mineralization of Barang, Bajaur Agency, Pakistan. Journ. Gemnology, London, vol.23 No.7: 402-408.

Rajpar, A.R. (1993). Taphonomy of a pliocene Quarry on the upper Siwalik, near Mirpur. Azad Jammu & Kashmir. Pak. J. Zool. vol. 25(3): 243-247.

Baqri, S.R.H. and A.R. Rajpar (1993). The clay mineral studies of the Khewra sandstone exposed at Khewra Eastern Salt Range. Geol. Bull. Univ. Peshawar, vol.24: 203-214.

Izert Alain and Iqbal Nayyar (1993). Genetic stratigraphy of the Lower Permian in the Salt Range. International Geological Programme Project 343. Bucharest, Romania: 12-13.

Brouth Jean, I. Alain, I. Nayyar and C. Robert (1993). Premieres donnees Palynologiques sur le Permian Inferieur de la Formation Tobra (Salt Range, Pak.). Implications Stratigraphiques et Paleogeographiques. Int. Prog. IGCP Project 543. Bucharest, Romania: 14.

3. ZOOLOGICAL SCIENCES DIVISION:

a) Reference Collection:

Nine trips to different parts of Palas Valley, Northern areas, Lahore, Faisalabad, Gujranwala, Murree and Galiat were made. Collected 510 small mammal specimens, 210 fishes, 50 herpetiles and 235 invertebrate specimens.

b) Laboratory Work:

Catalogued 2000 insect and 300 fish specimens. Preserved 510 mammal specimens. Identified 250 invertebrate and 90 fish specimens. Taxidermy of 15 birds and 10 mammals was completed while skinning of 15 birds was also accomplished.

c) Research Work:

i) Projects completed/in progress:

Curation of all reference collection of Zoological specimens and their cataloguing was carried out.

A collaborative project with Florida Natural History Museum on Small Mammals of Pakistan is in progress.

ii) Projects proposed/submitted:

Karyological analysis of the fishes belonging to subfamily Barbinae from Pakistan.

Zoogeographical and ecological studies of Malakand Division with reference to Biodiversity and conservation. Resubmitted the project after incorporating changes according to the referee's comments.

d) Extension work and Services Rendered to other Organizations:

Prepared slides of Fauna of different Ecosystems for the National Museum of Science and Technology, Lahore. Collaborative research projects with Florida Natural History Museum and Oxford University are underway.

Identified 30 zoological specimens for college students.

e) Publications:

Hasan, S.A. (1993). Three new species of the genus Heliomorpha Mayr (Heteroptera: Pentatomidae) from the Malayan subregion with phylogenetic consideration. Pak. Jour. Zool. 25(3): 205- 216.

Hasan, S. A. (1993). Fine structure of maxillary and mandibular stylets of some pentatomid bugs with special reference to phylogeny. P.J. Zool. 26(11): 39-41.

Hasan, S. A. (1994). Structure and finction of Labour in Pentatomid bugs (Heteroptera: Pentatomidae). Pak. Journ. Zool. 26(2): 99-104.

4. PUBLIC SERVICES DIVISION:

a) Museum Display and Maintenance:

During the report period, following assignments were completed:-

Designed and printed the poster on "Wildlife of Pakistan" given by Dr. Charles Wood of Florida Museum, USA.

Designed and prepared visuals and artwork for the advertisement about Design Services being offered by PMNH, for publication in yellow pages of Telephone Directory.

Redesigned the PMNH Newsletter and got it approved. Salt Range diorama in Museum Display Hall was improved by replacing worn out models.

Interior designing of the D.G.'s office, Committee room and Administration section for the new PMNH building was carried out.

Fabricated 20 plinths to provide pedestal to showcases of pre-historic Wildlife Display.

Designed letterhead and request card of Natural History Bulletin. Also completed artwork of PMNH and PSD leaflets.

Prepared background paintings of various displays like "Wolf" and "Bear" Displays at Display Corner.

Designed the cover page of "Research Perspective, vol.II".

Bilingual description and new identification key for the Wildlife display were prepared.

b) Educational Activities:

Guided tours were provided to 2600 students and 244 teachers belonging to 60 educational institutions.

During the Science and Technology Expo-93, 5000 students belonging to 80 educational institutions of Rawalpindi- Islamabad were provided guided tours.

Natural Museum of Science and Technology, Lahore (NMST):

Prepared slides of Flora and Fauna of different Ecosystems at NMST.

Submitted final report regarding compilation of the dioramas "Solar System" and 'Earth'.

Final touches were given to all display at NMST.

Pakistan Television Corporation Limited:

Co-ordinated with PTV (Ltd.) for recording of the programme "Sair Sawal".

Kashmir Museum:

Prepared layout plan for the display of the proposed Kashmir Museum.

Beacon-House School:

For the preparation of Natural History corner at Beacon-House School, meetings were held to select the space for the corner and to decide upon the theme of display. Teachers of the school were provided guidance to prepare initial sketches/drawings for the same.

Pakistan Science Foundation:

Installed an exhibition at the Pakistan Engineering Council Building, in connection with S&T Expo-93, organized in collaboration with Ministry of Science & Technology and PSF, at the COMSTECH meeting from 18th-22nd September, 1993.

Designed and prepared artwork of the badge and model of shield for S&T Fair-93. Also designed and prepared visuals for the roadside banner, car parking etc.

Designed shield and its model was prepared. Also prepared name cards of the participants of the Aero-modelling competition.

Prepared drawing for the interior decoration of the office of the Chairman, PS to Chairman, visitors waiting room, lobby, reception and cafeteria of new PSF building.

c) Number of Visitors:

Museum Building	=	12,300
Display Corner Marghazar	=	142,900

PAKISTAN SCIENTIFIC AND TECHNOLOGICAL INFORMATION CENTRE (PASTIC)

INTRODUCTION

Pakistan Scientific & Technological Information Centre (PASTIC) formerly known as Pakistan National Scientific and Technical Documentation Centre. (PANSDOC) was established in 1957 and placed under the administrative control of Pakistan Council of Scientific and Industrial Research (PCSIR) at Karachi. The centre worked there upto 1973 and was transferred at Islamabad in 1974 with the name of Pakistan Scientific and Technological Information Centre (PASTIC) and placed under the administrative control of Pakistan Science Foundation.

LOCATION

- National Centre. Islamabad.
- Sub Centre, Lahore.
- Sub Centre, Karachi.
- Sub Centre, Peshawar.
- Sub Centre. Quetta.

OBJECTIVES.

- i. To collect, organise, classify & disseminate information in all disciplines of science and technology to the scientific community of Pakistan.
- ii. To develop inter-library cooperation for sharing of resources.
- iii. To establish and maintain links with international/regional information networks/agencies.
- iv. To train information specialists in modern information handling and management techniques.
- v. To develop and strengthen the National Science Reference Library.
- vi. To collect data on S&T information.

PASTIC caters to the S&T Information needs of scientists and technologists of about 400 S&T Research Institutions of Pakistan. .

The Pakistan Scientific & Technological Information Centre under the aegis of Pakistan Science Foundation continued providing services of varied nature to fulfill the demand of R& D Sectors in the country. The activities carried out in terms of targets set by PASTIC & the achievements made are produced below:-

1. Information/Documentation Section

a) Document Procurement and Supply Service:

1717 S&T documents were procured from National/International Sources and supplied to researchers of S&T/R&D Organisations. The number of requests received were 2554.

b) Bibliographic Service:

One hundred and eighty six (186) subject bibliographies containing more than 21000 references were searched on CD-ROM and supplied to the clients.

c) Abstracting & Indexing Services:

Pakistan Science Abstract 1990 30(3-4) printed & despatched. PSA 1991 31(1-2)&(3-4) and PSA 1992 32(1-2) sent for printing. PSA 1992 32(3-4) have been proof read. PSA 1993 33 (1-2), 45 abstracts were classified, 780 keywords of 200 abstracts were prepared.

d) Union Catalogue:

Union Catalogue of 103 libraries has been finally printed.

2. Programming & Data Processing Section.

a) Computerization of S&T Information:

More than 1700 pages were composed during the period under report.

b) Software/Hardware Services:

Computer Software, Desktop publishing services and Hardware repair facilities were provided to other S&T organisations.

c) LAN Installation:

Local Area (LAN) has been started in PASTIC with seven intelligent terminals using Novelle Software for networking.

3. Technology Information Services

PASTIC disseminated technological and industrial information to potential users/entrepreneurs through monthly publication viz, "technology Information".

4. International Liaison

a) CEHANET

- i) Information was supplied on dissalination and waste.
- ii) Material was identified and collected for national EH Documents database and 105 records were entered in the database.

b) INFOTERRA

- i) Information supplied on pollution from paper mills, toxic chemicals, industrial pollution, Solid wastes management & recycling, Toxic chemicals, land fills, Honey Nutrition, Pollution & Kidney diseases, cement industries, sugar industries, ozone layer depletion and trace metals in hair.
- ii) 4 new sources registered.

c) ASTINFO

- i) IDAMS, CDS/ISIS and newsletter were distributed.
- ii) A liaison Officer for undertaking UNESCO activities was nominated by PASTIC.
- iii) The project entitled Applied Science & Technology Index on CD ROM has been completed.
- iv) Purchased UPS, CD ROM Drive and Ethernet Cards from the UNESCO funds.

5. PASTIC National Reference Library

More than 900 issues of different serials, 270 miscellaneous documents and 229 books were received, accessioned, classified, catalogued and shelved during the period under review.

6. Reprographic Unit

A total of 154 printing jobs were undertaken for 19 organisations including composing, offset and laser printings.

2638075 impressions, 3706 pages and 280108 copies were prepared.

7. Important Technical Meetings/Visits/Functions:

- a) PASTIC Officers and Staff participated in and organised Science and Technology Fair from 22nd Jan. 1994 to 6th Feb. 1994.
- b) 1st meeting of Governing Board of the SAARC Documentation Centre held in New Delhi from 13-14 May, 1994, was attended by Director PASTIC.

8. Development Programme of PASTIC

a) Strengthening of PASTIC National Science Reference Library:

Under this project PASTIC has acquired about 50 books, renewed subscriptions of 9 journals consisting of 132 issues and following databases on CD-ROM.

- MEDLINE from 1966 to 1993
- POLTOX from 1966 to date
- Science Citation Index for 1993 only.

b) Setting up Database facility at PASTIC:

Under this project PASTIC has acquired following equipment:

- I) Ethernet Card with T connector, (2)
- ii) Cable for Networking
- iii) 130 MB Hard Disk, (3)
- iv) Pc Mouse (4)
- v) Toner Cartridge (5)
- vi) 386DX-40 Mother Board
- vii) Panasonic Dot Matrix (3)
- viii) UPS with Battery

9. TIPS

Technological Information System (TIPS) was set up in 1987 and is a 24 hour global information resource for technology and trade. It was setup by United Nations Development Programme (UNDP), but now is working under Pakistan Science Foundation. TIPS network has electronic and satellite telecommunication system linkage in four continents and has twenty five national bureau with the head office in Rome (Italy) and regional offices in Manila and Caracas. In Pakistan TIPS national bureau is in the premises of PASTIC, which is also its counter part agency. The technical areas concered by TIPS are Biotechnology, Agricultural Machinery, Energy, Electronics.

To achieve its main objective of sharing information on trade and technology, it provides the following services.

- TIPS Bulletins (daily & weekly)
- Free Advertisement

- TIPS Database
- Business Query-Reply Service
- Business Facilitation
- Product promot

Achievements

TIPS published a book/directory on trade information in urdu which is now being sold all over Pakistan.

TIPS is playing an important role in enhancing the level of perception on the importance of information and has developed its image as an educational and economic tool.

In December 1994, TIPS alongwith PSF & PASTIC arranged a Computer Exhibition at Alhamra Arts Council in Lahore.

In 1994 TIPS reached a new landmark of possessing the world's largest database on offers & demands in the developing countries.

The information pouring into the TIPS database is regularly disseminated to the subscribers. Over 1000 organisations in Pakistan which include financial institutions, government organisations, chambers of commerce and industry, business enterpreneurs, universities and R&D organisations received this information.

CHAPTER 2

ORGANIZATION AND ADMINISTRATION

The organizational structures of the Pakistan Science Foundation, Pakistan Museum of Natural History and Pakistan Scientific & Technological Information Centre are given on the forth coming pages.

The staff position in the Foundation, PMNH & PASTIC during the period was as under:

PAKISTAN SCIENCE FOUNDATION (PSF)

Sr. No.	Designation	Number
1.	Chairman	1
2.	Member (Science)	1
3.	Member (Finance)	1
4.	Chief Scientific Officer	1
5.	Secretary	1
6.	Principal Scientific Officer	2
7.	Senior Scientific Officer	3
8.	Senior Research Officer	1
9.	Deputy Director (F&A)	1
10.	Deputy Secretary	1
11.	Science Promotion Officer	1
12.	Administrative Officer	1
13.	Accounts Officer	1
14.	Assistant Director (Budget, CP Fund and Pension)	1
15.	Research Officer	1
16.	PS to Chairman	1
17.	Librarian	1
18.	Scientific Officer	6
19.	Internal Audit Officer	1
20.	Caravan Incharge	5
21.	Graphic Artist	2
22.	Superintendent	1
23.	Assistant Research Officer	1
24.	PA to Chairman	1
25.	Mechanic for Instrument	1
26.	Assistant Scientific Officer	1
27.	Accountant	1
28.	Supporting Staff	125
	Total :	165

PAKISTAN MUSEUM OF NATURAL HISTORY (PMNH)

S.No.	Designation	Number
1.	Director General	1
2.	Director	3
3.	Curator	3
4.	Associate Curator	11
5.	Product Designer	1
6.	Research Associate	21
7.	Artist	1
8.	Administrative Officer	1
9.	Accounts Officer	1
10.	Librarian	1
11.	Taxidermist	2
12.	Associate Artist	2
13.	Teacher Guide	1
14.	Superintendent	1
15.	Accountant	1
16.	Stenographer	1
17.	Casting Staff	1
18.	Modeller	1
19.	Children Education Programmer	1
20.	Stenotypist	3
21.	Calligrapher	1
22.	Assistant Artist	2
23.	Fossil Preparator	1
24.	Photographer	1
25.	Office Assistant	1
26.	Purchase Assistant	1
27.	Accounts Assistant	1
28.	Cashier	1
29.	Senior Collection Incharge	2
30.	Key Punch Operator	1
31.	Incharge Embalming	1
32.	Skeleton Preparator	1
33.	Collection Incharge	2
34.	Drying & Fumigating Assistant	2
35.	Tracer	1
36.	Electrician	1
37.	Lathe Machine Operator	1
38.	Painter	1
39.	U.D.C.	2
40.	Store Keeper	1
41.	Field Assistant	12
42.	L.D.C.	2
43.	D.M O	1
44.	Dispatch Rider	1
45.	Driver	5
46.	Naib Qasid	8
47.	Guard	4
48.	Helper	4
49.	Gardener	1
50.	Chowkidar	10
51.	Sanitary Worker	5
	Total Posts	136

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

S.No.	Designation	Number
1.	Director	1
2.	Deputy Director (Doc.)	1
3.	Manager Reprographic Unit	1
4.	Senior Administrative Officer	1
5.	Senior System Analyst	1
6.	Senior Documentation Officer	1
7.	Senior Information Officer	1
8.	Senior Librarian	1
9.	Chief Editor	1
10.	Chief Liaison Officer	2
11.	Scientific Information Officer	3
12.	Admin. Officer (Karachi)	1
13.	Printing Officer	1
14.	Graphic Artist	1
15.	Translating Officer	1
16.	System Analyst	2
17.	Liaison Officer	2
18.	Manager Technology Information	1
19.	Accounts Officer	1
20.	Patent Officer	1
21.	Assistant Documentation Officer	2
22.	Assistant Manager Reprographic Unit	1
23.	Assistant Scientific Information Officer	4
24.	Assistant Programmer	3
25.	Superintendent (Admin.)	1
26.	Superintendent (Reprographic Unit)	1
27.	Accountant	1
28.	P.A. To Director	1
29.	Supporting Staff	91
Total:		130

CHAPTER-3

PAKISTAN SCIENCE FOUNDATION

FINANCIAL STATEMENTS

JUNE 30, 1994

AUDITOR'S REPORT TO THE BOARD OF TRUSTEES

We have audited the annexed Balance Sheet of PAKISTAN SCIENCE FOUNDATION as at June 30, 1994 and the related Receipts and Expenditure Account together with the notes forming part thereof for the year then ended and state that in our opinion the Balance Sheet, Receipts and Expenditure Account together with the notes forming part thereof respectively give a true and fair view of the state of the Foundation's affairs as at June 30, 1994 and of the surplus for the year then ended.

We further certify that these accounts include receipts of Rs.23,947,500/- comprise of grants received from Federal Government and we are satisfied with the priority of disbursement thereof.

**ILYAS SALEEM & CO.
CHARTERED ACCOUNTANTS.**

**PAKISTAN SCIENCE FOUNDATION
BALANCE SHEET AS AT JUNE 30, 1994**

GRANT AND LIABILITIES	NOTE	1994 Rupees	1993 Rupees
GENERAL FUND	2	15,011,971	12,375,397
RESEARCH SUPPORT GRANT	3	<u>29,116,863</u>	<u>27,572,997</u>
		44,128,834	39,948,394
CURRENT LIABILITIES	4	413,068	419,054
		44,541,902	40,367,448

The report of the auditors is set out on page 1

The notes set out on pages 5 to 9 from an integral part of these accounts.

TRUSTEE

CHAIRMAN

**PAKISTAN SCIENCE FOUNDATION
BALANCE SHEET AS AT JUNE 30, 1994**

FIXED CAPITAL EXPENDITURE	NOTE	1994 Rupees	1993 Rupees
Operating fixed assets	5	5,816,823	5,984,435
Capital work in progress		7,950,540	4,500,000
		13,767,363	10,484,435
RESEARCH PROJECT IN PROGRESS CURRENT ASSETS		29,116,863	27,572,997
UNESCO Coupons		180,000	176,970
Advances, deposits & Prepayments	6	415,259	1,213,607
Cash and bank balances	7	1,062,417	919,439
		1,657,676	2,310,016
		44,541,902	40,367,448

The report of the auditors is set out on page 1

The notes set out on pages 5 to 9 from the integral part of these accounts.

TRUSTEE

CHAIRMAN

**PAKISTAN SCIENCE FOUNDATION
RECEIPT AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED JUNE 30, 1994**

Receipts	Note	1994 Rupees	1993 Rupees
Development Grants		2,992,500	5,450,000
Non-Development		20,955,000	23,739,000
		23,947,500	29,189,000
 EXPENDITURE			
Development Grants			950,000
Non-Development			
Scientific Functions	8	9,028,007	9,326,017
Science Survey		110,184	328,795
Other Functions	9	1,390,888	2,297,405
Administrative Expenses	10	10,781,847	10,063,948
		21,310,926	22,016,165
		21,310,926	22,966,165
		2,636,574	6,222,835

SURPLUS CARRIED OVER

The report of the auditors is set out on page 1

The notes set out on pages 5 to 9 form an integral part of these accounts

TRUSTEE

CHAIRMAN

PAKISTAN SCIENCE FOUNDATION, ISLAMABAD

NOTES TO THE ACCOUNTS FOR THE YEAR ENDED 30, 1994

STATUS AND OBJECTS:

PAKISTAN SCIENCE FOUNDATION (Foundation) is a statutory organization established under Pakistan Science Foundation Act, 1973 on the day of 2nd February, 1973. The main object of its establishment is to promote and finance scientific activities having a bearing on the socio-economic needs of the country.

1. ACCOUNTING POLICIES:

The principle accounting policies which have been adopted in the preparation of the Foundation's accounts are as follows:

i) GRANTS RECEIVED

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

ii) RESEARCH SUPPORT GRANT

Research support grant has been accounted for on actual payment basis.

iii) FIXED ASSETS

Fixed assets have been valued at cost less accumulated depreciation except lease hold land which is valued at cost. Depreciation on fixed assets is charged on reducing balances method, at the rates specified in note 5.

iv) GENERAL

- a) Figures have been rounded off to the nearest rupees.
- b) Figures of the previous year have been regrouped and rearranged wherever deemed necessary for the purpose of comparison.

	1994	1993
	RUPEES	RUPEES
2. GENERAL FUND		
	12,375,397	6,152,562
Balance as on July 1		
Add: Balance transferred from Receipt and expenditure Account	2,636,574	6,222,835
	15,011,971	12,375,397
3. RESEARCH AND SUPPORT GRANT		
Balance as on July 1	27,572,997	23,994,400
Add: Disbursement during the year	6,015,166	7,324,144
	33,588,163	31,318,544
Less: Project completed during the year:	4,471,300	3,745,547
	29,116,863	27,572,997
4. CURRENT LIABILITIES		
Security Deposits	305,360	319,710
Accrued Expenses	107,708	99,344
	413,068	419,054

5. OPERATING FIXED ASSETS

Particulars	C O S T			D E P R E C I A T I O N				
	As at July 01, 1993	Additions	As at June 30, 1994	RATE %	As at July 01, 1993	For the year	As at June 30, 1994	Writing Down Value As at June 30, 1994
Lease hold land	3,713,418	-	3,713,418	-	-	-	0	3,713,418
Motor vehicles	2,533,790	-	2,533,790	20	1,620,056	182,747	1,802,803	730,987
Office equipment	1,076,527	114,250	1,190,777	15	777,196	62,037	839,233	351,544
Science equipment	969,833	-	969,833	15	675,816	44,103	719,919	249,914
Furniture & fixture	825,400	3,760	829,160	6	348,543	28,837	377,380	451,780
Air conditioner	194,974	-	194,974	15	159,189	5,368	164,557	30,417
Library books & films	336,765	52,673	389,438	5	85,502	15,197	100,699	288,739
Bicycle	680	-	680	20	650	6	656	24
1994 Rupees	9,651,387	170,683	9,822,070		3,666,952	338,295	4,005,247	5,816,823
1993 Rupees	8,158,879	1,492,508	9,651,387		3,283,827	383,125	3,666,952	5,984,435

6. ADVANCES, DEPOSITS AND PREPAYMENTS	1994	1993
	Rupees	Rupees
Advances to Staff	133,159	95,153
Deposits	5,500	5,500
Prepaid rent	276,600	1,112,954
	415,259	1,213,607

7. CASH AND BANK BALANCES

In hand	27,652	26,454
UNESCO Coupons	730,461	573,929
In Bank-NBP Account No. 52	304,304	319,056
	1,062,417	919,439

8. SCIENTIFIC FUNCTIONS

Research and Support Grant	6,015,166	7,324,144
Scientific Societies and Professional Bodies.	585,000	603,000
Scientific Conferences, Meetings and Seminars.	520,000	430,832
Operation of Science Caravan.	1,907,841	968,041
	9,028,007	9,326,017

	1994	1993
	RUPEES	RUPEES
9. OTHER FUNCTIONS		
Science centres & herbaria	-	262,845
Information and documentation	149,600	29,385
Awards, prizes and fellowship.	128,650	100,000
Informational Liaison	207,956	44,769
Science Promotion Activities.	636,682	712,406
Scientist pools	168,000	48,000
Science Fair	100,000	1100,000
	1,390,888	2,297,405
10. ADMINISTRATIVE EXPENSES		
Salaries and other benefits	6,481,226	6,354,175
Travelling	82,095	70,594
Rent	2,105,156	1233,678
Electricity, gas and water.	125,477	125,311
Postage, telephone and telegram	763,271	961,657
Printing & Stationery	109,329	217,801
Vehicle running and maintenance	522,625	506,081
Newspapers and periodicals	37,200	31,075
Liveries and Uniforms	6,309	7,479
Entertainment	24,590	33,594
Repair and Maintenance	45,440	56,586
Audit fee	12,500	12,500
Advertisement and publicity	68,882	48,954
Law Charges	--	5,501
Haj expenses	51,680	--
Depreciation	338,295	383,125
Miscellaneous	9,772	15,837
	10,781,847	10,063,948

**FINANCIAL STATEMENTS AND AUDITORS REPORT
FOR THE YEAR ENDED JUNE 30,1994.
PAKISTAN MUSEUM OF NATURAL HISTORY, ISLAMABAD**

We have examined the annexed Balance Sheet of 'PAKISTAN MUSEUM OF NATURAL HISTORY ISLAMABAD' (DEVELOPMENT ACCOUNT) as at June 30, 1994 and we state that we have obtained all the information and explanation which to the best of our knowledge and belief were necessary for the purpose our audit and we report that:

- a) The balance sheet and income and expenditure account are in agreement with the books of account produced to us. We are satisfied that the amount of grant shown in the statement of account has been spent on the objects for which it was made within the specified limit. We have also satisfied ourselves about the propriety of the disbursement made from the grant.
- b) In our opinion and to the best of our information and according to the explanations given to us, the Balance Sheet gives a true and fair view of the state of Pakistan Museum of Natural History Islamabad affairs as at June, 30, 1994.

**PAKISTAN MUSEUM OF NATURAL HISTORY ISLAMABAD
DEVELOPMENT ACCOUNT
BALANCE SHEET AS AT JUNE 30, 1994.**

FUNDS & LIABILITIES	1994 Rs	1993 Rs	PROPERTY & ASSETS	NOTE	1994 Rs.	1993 Rs.
FUNDS						
GOVERNMENT FUND			FIXED ASSETS - AT COST (As per schedule attached)		10,832,931	8,107,839
Balance as at 01-07-1993	57,714,914	42,714,914				
Balance of last years Grant	2,989,586	42,714,914		1	54,075,683	35,968,804
Grant in aid for the year	60,704,500 4,982,250 65,686,750	15,000,000 57,714,914	CAPITAL WORK IN PROGRESS	2	778,136	13,638,271
			CURRENT ASSETS Advance & Prepayment			
	65,686,750	57,714,914			65,686,750	57,714,914

The annexed notes form an integral part of these accounts.

ADMINISTRATIVE OFFICER

ACCOUNTS OFFICER

**PAKISTAN MUSEUM OF NATURAL HISTORY ISLAMABAD
DEVELOPMENT ACCOUNT
FIXED ASSETS AS AT JUNE 30,1994**

PARTICULARS	BALANCE AS AT JULY 1, 1993	ADDITIONS	BALANCE
Land	-	2,576,000	2,576,000
Vehicles	827,200	-	827,200
Generator	8,990	-	8,990
Laboratory Equipment	6,668,913	118,010	6,786,923
Books	602,736	31,082	633,818
RUPEES	8,107,839	2,725,092	10,832,931

**PAKISTAN MUSEUM OF NATURAL HISTORY, ISLAMABAD
DEVELOPMENT ACCOUNT
NOTES TO THE ACCOUNTS FOR THE YEAR ENDED JUNE 30, 1994**

1. CAPITAL WORK IN PROGRESS:

	BALANCE AS AT JULY 1, 1993	ADDITIONS ADJUSTMENTS	BALANCE AS AT JUNE 30, 1994
	Rs.	Rs.	Rs.
Building	31,292,012	18,089,989	49,382,001
Display Centre	382,209	16,890	399,099
Un-allocated	4,294,583	-	4,294,583
	35,968,804	18,106,879	54,075,683

2. ADVANCES AND PREPAYMENTS.

	J u n e 30	
	1994	1993
	Rs.	Rs.
Advances to Consultant	690,556	13,603,105
Prepaid Insurance	60,777	8,363
Prepaid Rent	26,803	26,803
	778,136	13,638,271

3. PRIOR YEARS FIGURES.

Previous years figures have been rearranged, wherever necessary, for the purpose of comparison.

AUDITORS REPORT

We have examined the annexed Balance Sheet of PAKISTAN MUSEUM OF NATURAL HISTORY ISLAMABAD' (NON DEVELOPMENT ACCOUNT) as at June 30, 1994 and the related Income & Expenditure Account for the year then ended and we state that:

Depreciation on the fixed assets has not been provided for in the accounts by the organization from the date of its inception.

Except for the effects of such adjustments, if any, had the depreciation been provided for as stated in the preceding paragraphs, we have obtained all the information and explanation which to the best of our knowledge and belief were necessary for the purpose of our audit and we report that:

- a) The balance sheet and income and expenditure account are in agreement with the books of account produced to us. We are satisfied that the amount of grant shown in the statement of account has been spent on the objects for which it was made within the specified limit. We have also satisfied ourselves about the propriety of the disbursement made from the grant.
- b) In our opinion and to the best of our information and according to the explanations given to us, the Balance Sheet, Income & Expenditure Account give a true and fair view of the state of the Pakistan Museum of Natural History Islamabad affairs as at June 30, 1994 and its income for the year then ended.

Hameed Khan & Co
Chartered Accountants

Lahore
Dated June 15, 1995

**PAKISTAN MUSEUM OF NATURAL HISTORY ISLAMABAD
NON DEVELOPMENT ACCOUNT
BALANCE SHEET AS AT JUNE 30, 1994**

FUNDS & LIABILITIES	1994 Rs	1993 Rs.	PROPERTY & ASSETS	1994 Rs.	1993 Rs.
FUNDS					
GOVERNMENT FUND			FIXED ASSETS - AT COST	4,795,680	4,853,618
			(As per schedule attached)	10,832,931	8,107,839
Accumulated Surplus as on 01-07-1993	5,074,217	4,588,962			
Add: Excess of income over Expenditure	649,082	485,255	CURRENT ASSETS		
Grant in aid for the year	5,723,299	5,074,217	Consumable store	-	11,955
			Advance Rent	974,771	210,390
			Advance against expenses	49,161	-
			Cash in hand	4,242	4,254
				1,028,174	226,599
 <u>CURRENT LIABILITIES</u>					
Audit fee payable	6,000	6,000			
Accrued expenses	94,555	-			
	100,555	6,000			
	5,823,854	5,080,217		5,823,854	5,823,854

ADMINISTRATIVE OFFICER

ACCOUNTS OFFICER

PAKISTAN MUSEUM OF NATURAL HISTORY ISLAMABAD
NON DEVELOPMENT ACCOUNT
SCHEDULE OF FIXED ASSETS AS AT JUNE 30, 1994

PARTICULARS	BALANCE AS AT	ADDITION	ADJUSTMENT	BALANCE AS
Land	1,050,000	--	--	1,050,000
Vehicles	761,178	--	--	761,178
Furniture & Fixture	992,349	24,660	1,017,009	
Office & Laboratory Equipments	1,547,525	31,665	--	1,579,191
Books	363,302	--	--	363,302
Whale & Elephant	25,000	--	--	25,000
Chemical	114,263	--	(114,263)	--
Rupees	4,853,618	56,325	(114,263)	4,795,680

PAKISTAN MUSEUM OF NATURAL HISTORY ISLAMABAD
NON DEVELOPMENT ACCOUNT
INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED JUNE 30, 1994

INCOME	1994	1993
	Rs.	Rs.
Grant from Government	8,872,000	8,500,000
 EXPENDITURE		
Salaries & Allowances	5,464,575	4,511,112
Medical Expenses	407,575	234,358
C.P.F Contribution	403,213	301,021
G.L.I contribution	13,445	11,514
Gratuity	27,356	826,381
Office Rent	871,355	1,225,152
Ground Rent	7,563	6,049
Traveling Expenses	108,163	107,127
Repairs & Maintenance	29,225	25,258
Haj Expenses	51,680	15,000
Postage and Telephone	294,147	232,055
Printing & Stationery	185,336	125,553
Consumable Stores	114,263	125,553
Sale Proceeds of Vehicles	--	145,618
Loss on Sale of Vehicles	--	129,336
Entertainment	5,731	1,509
Vehicle Expenses		142,824
Uniform and Liveries	4,785	3,450
Audit Fee	6,000	6,000
Advertisement	49,327	1,844
Newspaper and Magazines	8,228	4,840
Miscellaneous Expenses	28,127	20,774
Prior Years Adjustment	--	5,729
	8,222,918	8,014,745
 Excess of Income Over Expenditure Carried to Balance Sheet	 649,082	 85,255

ADMINISTRATIVE OFFICER

ACCOUNT OFFICER

PAKISTAN SCIENCE FOUNDATION ACT 1973

**National Assembly of Pakistan
Islamabad, the 2nd February, 1974**

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 there to,

It is hereby enacted as follows:-

1. **SHORT TITLE, EXTENT AND COMMENCEMENT** (I) 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 context.
 - a) 'Board' means the Board of Trustees of the Foundation;
 - b) 'Chairman' means the Chairman of the Foundation; and
 - c) 'Foundation' means the Pakistan Science Foundation established under this Act.
3. **ESTABLISHMENT OF THE FOUNDATION:** (1) As soon as may be after the commencement of this Act, the Federal Government may, by notification in the official Gazette, establish a Pakistan Science Foundation to promote and finance scientific activities having a bearing on the socio-economic needs of the country.
 - 2) The Foundation shall be a body corporate by the name of the Pakistan Science Foundation, having perpetual succession and a common seal, with power, subject to the provision of this Act, to acquire, hold and dispose of property, both movable and immovable, and shall be 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 to:-

- i) the establishment of comprehensive scientific and technological information and dissemination centers;
- 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 centers, clubs, museums, 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 of technology in particular;
- vi) the organisation of periodical science conferences, symposia and seminars;
- vii) the exchange of visit 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 organisation 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; and
- 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 the Chairman or the Executive Committee such of its power and functions as it may consider necessary.

12. **ADHOC COMMITTEES:-** 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 the results of research sponsored by the Foundation.

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

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

14. **BUDGET:-** The Foundation shall cause to be prepared and approve a statement of its receipt 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 the Auditor-General of Pakistan may determine in consultation with the Federal Government.

3) The accounts of the Foundation shall be audited by one or more auditors who are chartered accountants within the meaning of the Chartered Accountants Ordinance, 1961 (X of 1961) and are appointed by the Foundation in consultation with the Auditor-General of Pakistan.

16. APPOINTMENT OF OFFICERS AND SERVANTS:- (I) 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 REPORTS:- (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.