BIRBAL SAHNI INSTITUTE OF PALAEOBOTANY LUCKNOW

ANNUAL REPORT

1975-76

ANNUAL REPORT
1975-76

BIRBAL SAHNI INSTITUTE OF PALAEOBOTANY
LUCKNOW

CONTENTS

I. INTRODUCTION

The Institute conducts research on Palaeobotany, the discipline dealing with various aspects of plant fossils. The research projects at the Institute are organised under six scientific departments and two special units. Some of the broad areas of research to be conducted during the Vth Five Year Plan period are :

1. Search for early plant life in Indian rocks older than 300 million years.

2. To build up a composite picture of plant life as existed during the coal-forming period in India.

3. The evolution of plant life through the geological ages in India.

4. History of plant life during the last glacial epoch in India.

5. History of cultivated plants of India.

6. Study of pollen and spores recovered from sediments of various ages to ascertain the location and distribution of coal seams.

7. Study of pollen and spores from various sediments to indicate favourable areas for oil prospecting.

8. Intensive field mapping of prospective coal and oil containing areas for correlation.

9. Dating of sediments with radioactive isotopes.

During the year under review many important contributions were made under different plan and non-plan projects. Some of the important findings are :

1. Microbiota obtained from the Suket has enabled to date these shales as Late Precambrian.

2. Some more fructifications attached on *Glossopteris* leaves have been found from the coal-bearing horizons of the Raniganj Coalfield. One new genus has been recognised. Some concrete ideas have emerged from this study regarding the plants which laid down our rich coal deposits.

3. On the basis of megafossil finds, Triassic beds near Nidhpur, Sidhi District were further extended.

4. For the first time the miospore genus *Marsupipollenites* has been found in fairly large numbers from the Upper Permian beds of India. This genus is a characteristic element of Australian Upper Permian. Also a palynological correlation of coal seams in the Kusmunda Block, Korba coalfield, Madhya Pradesh has been established.

5. An angiospermous inflorescence has been discovered from the Mohgaonkalan chert beds. Its affinities have been traced to the families Liliaceae and Restionaceae.

6. Palynological studies have revealed a sharp palynological change between the Mahadeo and Langpar formations in the South Shillong Plateau.

7. After a re-examination of published pollen data from Rajasthan it is now inferred that the lakes were moderately saline to begin with and had probably risen once during 6000-5000 B. P.

   Evidence of rapid silting has been found in the upper part of the 3 m profile from Lake Mandhata, District Pratapgarh.

8. Some more remains of cultivated plants have been identified from various archaeological sites.

9. The Radiocarbon dating laboratory became operational in January, 1976. The intercomparison samples have been dated with good agreement in ages known and obtained. We are now ready to take up full work on C-14 dating. Ours is the Second C-14 Laboratory in the country.

Close collaboration was maintained for interdisciplinary studies with Indian Statistical Institute, Calcutta, Oil and Natural Gas Commission, Jodhpur, University of Lyon, France, Oil India Ltd., Duliajan, Directorate of Mineral Research, Meghalaya, Geology Department, University of Lucknow, Geological Survey of India, and others. A beginning has been made for a close collaboration with the Oil and Natural Gas Commission.

Training in Palaeobotanical methodology and research programming was provided to representatives of several Universities and colleges. Technical assistance on palaeobotanical and related problems was provided to several institutions and individuals from India and abroad.

Many members of the scientific staff participated in National and International meetings/symposia/Conferences. Some of them have been nominated or renominated on various national and international committees.

SHRI K. D. MALAVIYA, UNION MINISTER FOR PETROLEUM & SHRI N. D. TIWARI, CHIEF MINISTER OF UTTAR PRADESH DURING A VISIT TO THE INSTITUTE

II. RESEARCH

1. PRE-GONDWANA

1. 1. Vindhyan Formation

The study of the microbiota and *Fermoria* like remains recovered from the Suket shales, Madhya Pradesh was completed. The microbiota comprises algal, fungal and acritarch remains. On the basis of this study a Late Pre-Cambrian age has been assigned to these beds.

1. 2. Jutogh Formation

The microbiota recovered from the rocks of Jutogh Formation collected around Simla comprises acritarchs *(Granomarginata, Ellipsaletes* and *Anguloplatinia)*, fungal filaments and plate-like remains.

2. LOWER GONDWANAS

2. 1. Morphological Studies in the Glossopteris Flora

2. 1. 1. *Pteridophytes*

A. A critical morphological study of *Stellotheca robusta* was undertaken on 300 newly collected specimens of shoots from the Lower Gondwana beds of Pachwara Coalfield, Bihar.

B. Ferns collected from Tattitola, Pachwara Coalfield, Bihar and Handappa, Dhenkanal District, Orissa were investigated. Two new types have been identified on the basis of external morphology.

C. A critical study of the spores *in situ* isolated from the fertile fronds of the Indian Lower Gondwana ferns has been undertaken. Biometric analysis has been applied systematically to locate the morphographic parameters. The study indicates that the trilete spores show little variation in their shape, size and exine patterns.

D. Attempts have been made to reconstruct some fern fronds (e.g. *Neomariopteris, Dichotomopteris & Dizeugotheca)* from fragments of fronds available. For this purpose, branching pattern and the size of the pinnules have been taken into consideration.

2. 1. 2. *Gymnosperms*

Biometric studies of three *Glossopteris* leaves have been completed, giving importance to the course of secondary veins. They are drawn on 1 sq cm grid to see how they bifurcate, fork or interconnect for meshes. This system has now been found very useful in *G. communis* and *G. indica.* A paper is being finalized.

2. 1. 3. *Lower Gondwana Floras from the Damodar Valley and Extension*

A. *Auranga Coalfield, Bihar*

The results of studies on the mega-and miofloral assemblages of the Karharbari and Barakar stages have been finalized and papers have been sent to Press.

The Karharbari megaflora contains 9 species belonging to 7 genera. The miofloral assemblage comprises 19 genera and 39 species and is dominated by *Parasaccites* and *Galiumispora.*

The Barakar megaflora consists of 11 species of *Glossopteris* of which *G. churiensis* is a new one. The mioflora comprises 32 genera and 54 species. A new genus *Aurangapollenites* has been instituted for certain nonstriate disaccate miospores with pitcher-shaped sacci.

B. *Hutar Coalfield, Bihar*

The collection from the Hutar Coalfield includes a few *Glossopteris* and *Gangamopteris* leaves and some seed-like bodies. Palynological samples have yielded a fairly rich mioflora which is under detailed study.

Tentatively, the miofloras from different levels seem to indicate the presence of the Talchir, Karharbari and Barakar formations in the area.

C. *Raniganj Coalfield, West Bengal*

Investigations have been undertaken on the cuticular structure of glossopterid fructifications from the Raniganj Coalfield, West Bengal. Four types of fertile genera, viz., *Dictyopteridium*, *Scutum*, *Cistella* and a new genus *Plumsteadiostrobus* have been recognized. Studies of *Dictyopteridium* and *Plumsteadiostrobus* have been completed and two papers have been sent to Press.

A new species of *Dictyopteridium*, *D. feistmantelii* found attached to *Glossopteris tenuinervis* Pant & Gupta is represented by many attached and detached specimens. The cuticular studies confirm the previous observation that *Dictyopteridium* has a protective scale which covers the fertile organ from one side. *Plumsteadiostrobus* is also a female fructification found attached to *G. taenioides* Feistmantel.

2. 2. Sporae Dispersae and Palynostratigraphy

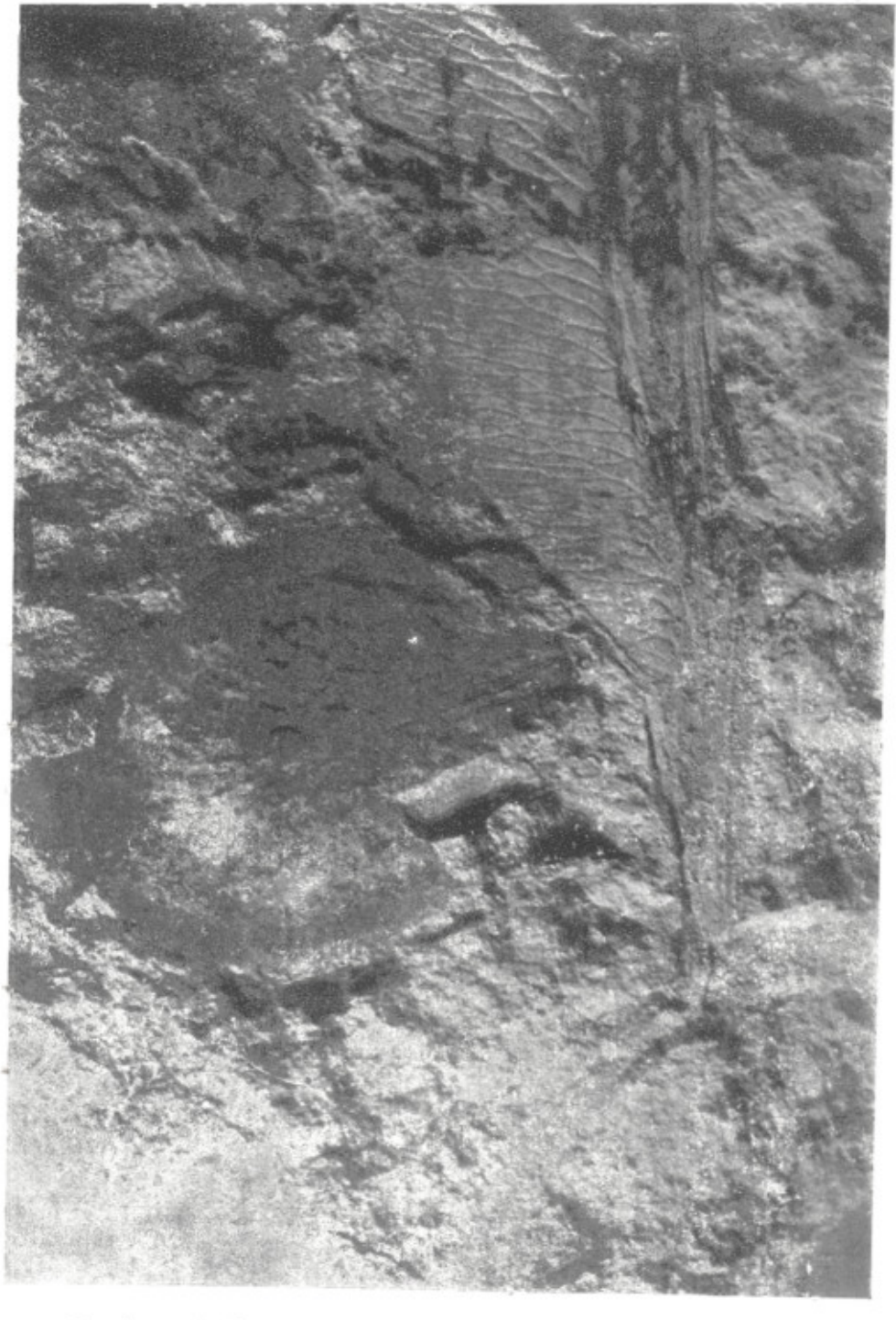
2. 2. 1. *Morphology of Lower Gondwana Spores*

Biometric resolution of *Plicatipollenites* and *Potonieisporites* complex was extended to the Talchir and Karharbari formations of the Giridih and Jayanti Coalfields, Bihar. In each case about 200 grains were counted to study the relative variational patterns of characters like the tetrad mark and the symmetry of body infold system, body or the grain. The results more or less agree with those earlier obtained from the South Rewa Basin. Broadly speaking, circular (radial) forms *(Plicatipollenites* type) tend to be trilete or triletoid while oval (bilateral) forms *(Potonieisporites* type) tend to be monolete or monoletoid. There is a reasonable little overlap between the two morphological sets. It seems possible to locate this overlap by biometric analyses and to identify the two taxonomic units. Results also seem to indicate that the overlap between the two genera may reduce in time. Similarly bilateral forms may appear to increase in the Karharbari as compared to the Talchir. Some of these points need confirmation from other areas.

A large number of specimens of the genus *Callumispora* have been isolated from the rocks and Talchir to Panchet series for ultrastructural studies. In all 23 samples from the Giridih, Korba, Raniganj and Talcher coalfields were processed for this work.

2. 2. 2. *Miofloras from Talchir Series from West Bokaro Coalfield, Bihar*

Palynostratigraphic studies on the Talchir Formation in the Dudhi River Section indicate that the early Talchir mioflora is qualitatively as well as quantitatively poor. It is characterised by monosaccate forms like *Parasaccites*,



Female reproductive organ, *Scutum sahnii* attached on a *Glossopteris* leaf

Plicatipollenites and *Potonieisporites*. The late Talchir mioflora is contrastingly rich and diversified, being characterised, in addition to the above 3 genera, by such forms as *Jayantisporites*, *Tuberisaccites*, *Caheniasaccites*, *Limitisporites*, *Crescentipollenites*, *Faunipollenites* and *Striatoparvisaccites* gen. nov. A complete paper was sent to Press.

In another study a somewhat younger palynological assemblage has been recognised. This assemblage is chiefly dominant in *Callumispora* + radial monosaccates, and suggests the presence of Karharbari Stage in this area. In addition to these, grooved metamorphic basement has also been observed. The manuscript is being finalized for publication.

2. 2. 3. A scientific approach based upon statistical resolution of variations, in the quantitatively and qualitatively significant characters from small or large populations, for delimitation of species in sporae dispersae has been made. Methods to test homogeneity of samples or qualitative characters have also been assessed with suitable samples.

2. 2. 4. Palynological correlation of coal seams in Kusmunda block, Korba Coalfield has been established on the basis of three distinct miospore assemblages. They are *Horriditriletes* assemblage group, (ii) *Faunipollenites* assemblage group, and (iii) *Sulcatisporites* assemblage group.

2. 2. 5. Twenty five samples of Lower Gondwana sediments exposed north of Village Honhe and between Chandaul and Horan villages, North Karanpura Coalfield were studied palynologically. Two distinct assemblages have been distinguished near Honhe. The older, dominant in radial monosaccates, represents the Talchir Stage while the younger, being dominant in *Callumispora* + radial

monosaccates, suggests the presence of Karharbari Stage.

2. 2. 6. Subsurface and surface samples from different localities in the Talchir Coalfield were macerated. The samples from Talchir Stage were barren of miospores while the over lying coal and shales yielded good quantity of miospores. Eight samples have been counted at generic level.

2. 2. 7. In the Raniganj Coalfield, samples from the Raniganj and Panchet stages were processed for miospores. The miospore yield was—

Nonia Nala – in 13 samples out of 44
Nonia Khal – in 1 sample out of 19
Machhkanda Jhor – in 8 samples out of 30

The paper on "A permo-Triassic mioflora from Raniganj Coalfield, India" was revised. Plates and explanation thereof, were remodelled and portions of taxonomy as well as discussion were rewritten.

2. 2. 8. A large number of specimens belonging to certain trilete genera were examined to study the variation for specific delimitations. The line of study has been decided after evaluating the morphographic characters in these genera.

2. 2. 9. Out of seven samples from the Dhardharia Nala Section, East Bokaro Coalfield, only one sample yielded miospores, which were counted for quantitative considerations.

2. 2. 10. Data on morphography of miospores and distribution studies of spore genera encountered in various samples of South Karanpura Coalfield have been collected. The data are being incorporated in a Ph. D. thesis.

2. 2. 11. The detailed morphological study and photography of various miospore types selected from Sohagpur, Chirimiri, Bisrampur and Giridih coalfields have been made. Some morphological groupings have been done on the basis of statistical analysis of the characters.

2. 3. Petrology and Palynology of Coals

2. 3. 1. An evaluation study based on extensive analysis of microconstituents of coals from Karharbari, Barakar and Raniganj stages has been completed. The study reveals characteristic "composite genetic coal types" in the Lower Gondwana sequence.

2. 3. 2. Lexique sheets on nomenclature and anlysis of Gondwana coals were prepared and presented during the I. C. C. P. meetings held in Moscow during October, 1975.

2. 3. 3. Microscopic study on the nature and composition of Kargali Seam and the assemblage pattern of microconstituents indicate abundant anthraxylous elements derived from barks. Spore pollen, cuticle and exinite elements are rare. Biopetrological evaluation indicates coking ability of the coals.

3. PALAEOZOIC FROM ABROAD

3. 1. 1. For compilation of the Devonian palynology of the world, a large number of index cards were prepared, research papers consulted and relevant data incorporated in the synthesis.

3. 1. 2. Literature on the Permian miofloras from all over the world were scanned. The abstracts of important papers were prepared. Palynological successions of the Lower Gondwana sequence from the southern continents have been synthesized. Relevant charts have been made.

3. 1. 3. Continued re-examination of palynofossils from Brazil.

4. MESOZOIC

4. 1. Megafossil Assemblages

4. 1. 1. *Triassic Flora*

A. A paper on some plant remains from the Lower Triassic of Auranga Valley, District Palamau, Bihar was finalized and sent to the Press. The characteristic elements of the flora are *Trizygia, Schizoneura, Glossopteris, Vertebraria, Dicroidium, ?Noeggerathiopsis* and a few detached ?pinnules with cuticle like that of *Lepidopteris.*

B. The study of megafloral assemblages from 3 exposures along Gopad River near Madwas, Sidhi District, Madhya Pradesh was finalized and a paper submitted for publication. On the basis of contained megafossils, the 3 exposures could be tentatively dated as ?basal most Triassic, Lower Triassic and ?Middle Triassic. The important elements of the 3 assemblages are *Sphenopteris, Glossopteris, Scutum, Vertebraria, Dicroidium, Taeniopteris* and a few scale and seedlike bodies.

From the same area four new species of scale leaves belonging to the genus *Glottolepis* have been identified on the basis of cuticular characters. The paper which has been sent for publication also includes certain observations on *G. rugosa* Bose & Srivastava.

C. Studies on the pteridospermous remains from the South Rewa Basin have been continued.

D. A review of the Floristics of the Upper Palaeozoic and Lower Mesozoic Gondwanas of India was written for the XII International Botanical Congress, Leningrad. An

abstract of the review has been published in the proceedings of the Congress.

4. 1. 2. *Jurassic-Cretaceous Flora*

A. The work on the cycadophytic leaves from the Mesozoic rocks of India has been continued. Some slides of petrified araucarian woods from a new locality from the Jurassic of the Rajmahal Hills have been studied.

B. A paper on the cuticular structure of 3 new species of *Elatocladus* and 2 new species of *Pagiophyllum* from Sehora, Narsinghpur District, Madhya Pradesh was finalized and sent to Press. The species have been distinguished on the basis of the cuticular characters.

C. The work on *Hausmannia dichotoma, Gleichenites* sp., *Cladophlebis medlicottiana* and three species of *Ptilophyllum* from the Jabalpur Series has been finalized. A number of cuticular preparations from some specimens of *Ptilophyllum, Brachyphyllum, Desmiophyllum* and *Araucarites* from Parsapani, Sehora and Hathnapur have been prepared. Some of these specimens and their cuticles have been photographed.

Some megafossils from the fresh collections of Gujarat have been photographed. Cuticular preparations have been prepared of some gymnospermic leaves.

Plant fossils collected from Golapili Sandstones were examined. Preliminary identification shows the presence of *?Cladophlebis, Ptilophyllum, Elatocladus, Brachyphyllum, Pagiophyllum, Araucarites* and *Coniferocaulon*. These specimens have been photographed.

A synopsis of salient features of Indian Mesozoic and some living members of Matoniaceae and Gleicheniaceae

has been prepared.

4. 2. Sporae Dispersae and Palynostratigraphy

4. 2. 1. *Triassic Palynoflora*

Preliminary study of a large number of palynological samples collected from the northern bank of Damodar River in the Raniganj Coalfield revealed a miofloral assemblage similar to that from Nonia Nala Section. Important forms are *Punctatisporites, Playfordiaspora, Alisporites, Gondwanipollenites* and *Protohaploxypinus.*

A large number of specimens of the genus *Marsupipollenites* from the Gopad River Section near Gothara, Sidhi District, Madhya Pradesh have been scanned and photogrphed.

Study of Triassic palynology of the South Rewa Gondwana Basin has been continued. Preliminary descriptions of the different taxa have been written from the Janar Nala Assemblage. For taxonomic purposes it was found necessary to prepare genera and species cards of the known Triassic palyno taxa. A beginning in this direction has been made.

Writing of the chapter on Triassic Palynology for the book "World Pollen Floras" was started. About a dozen countries have been covered so far.

4. 2. 2. *Jurassic-Cretaceous Palynoflora*

A. Palynological samples collected during previous years from Imjhiri, Narsinghpur District were macerated but all proved to be nonproductive. More samples from Narsinghpur District are being processed for pollen and spores.

B. Palynological studies from the Upper Gondwanas of the South Rewa Basin have been continued.

C. A large number of samples from the Upper Mesozoic formations in Kutch and Surendranagar Districts of Gujarat were processed for palynomorphs. Some of the slides from productive samples have been scanned.

D. Out of 16 carbonaceous shale samples from Sidheshwar Hill, eleven shale samples have yielded well preserved miospores. The prepared spore slides have been thoroughly scanned for taxonomic study.

4. 2. 3. The catalogueing of reprints of Mesozoic palynological section of the Institute library is continued.

4. 3. Mesozoic from Abroad

4. 3. 1. *Palynological Studies on Some Coals, Iran*

A. Taxonomic study of Zirab coals is completed but due to a further search for angiospermic pollen for the study of ultrastructures, the manuscript could not be finalized for the Press.

B. Taxonomic study of miospores from another area is continued.

5. CENOZOIC

5. 1. Morphological and Anatomical Studies

5. 1. 1. *Deccan Intertrappean Flora*

Four fossil woods from the Deccan Intertrappean beds of Mandla District, Madhya Pradesh were identified as *Sterculia, Grewia, Elaeocarpus-Echinocarpus and Limonia-Atlantia* belonging to the family Sterculiaceae, Tiliaceae,

Elaeocarpaceae and Rutaceae respectively. The manuscript of the paper is almost ready for publication.

Two pieces of petrified palm were studied in detail and photographed. One of them shows a prominent lacunar ground tissue and probably belongs to *Cocos*-like palms. A detailed anatomical study of the stem and petiole of *Caryota urens* and the stem of *Calamus* was taken up and sections were prepared from different regions so as to study the anatomical variability.

A paper on an angiospermous inflorescence discovered from the cherts of Mohgaon Kalan is almost ready for publication. The inflorescence shows affinities with the inflorescences of the families Restionaceae and Liliaceae.

5. 1. 2. *Leaf-impressions from Laki Series, Kutch*

Out of many leaves tentatively identified earlier from the Eocene beds of Panandhro, District Kutch, the identification of one leaf with *Ficus* was confirmed.

5. 1. 3. *Fossil Woods from Kankawati Series (Manchar), Kutch*

Out of nearly a dozen fossil woods from the Pliocene of Dhaneti and Mothala the identifications of *Dipterocarpus*, *Cynometra*, *Afzelia-Intsia*, *Albizia*, *Isoberlinia*, *Terminalia* and a palm were confirmed. These plants indicate a much higher rain fall and a humid climate in Kutch during the Pliocene times. At present this region is featured by a scrub vegetation.

5. 1. 4. *Fossil Wood from the Siwalik beds of Himachal Pradesh*

Woods of *Anisoptera*, *Dipterocarpus*, *Cassia*, *Afzelia-Intsia*, *Cynometra*, *Chisocheton*, *Careva*, and a few others

belonging to Malvaceae and Leguminosae were further identified from the Lower Siwalik beds of Nalagarh and Dhaula Kuan in Himachal Pradesh.

5. 1. 5. *Fossil Woods from Eastern India*

A. *Tipam Series*

Detailed studies on the petrified woods from the Tipam sandstones near Hailakandi in Cachar District, Assam have revealed the presence of *Cynometra, Mangifera, Melanorrhoea, Madhuca, Shorea* and *Ougenia.* Modern species of these genera are still found in the forests of Assam and neighbouring areas.

B. *Dupitila Series*

A large number of petrified woods from the Namsang beds near Deomali, Arunachal Pradesh were further investigated. The identification of the woods studied earlier were confirmed as *Sterculia, Heritiera, Dipterocarpus, Mangifera, Garuga, Millettia, Albizia, Lagerstroemia* and *Litsea-Phoebe.* There are still many other new forms which are being identified with the modern taxa. This flora seems to be very rich as compared to other Neogene floras of North-East India.

5. 1. 6. *Fossil Woods of the Cuddalore Series*

From the Cuddalore sandstones of Murattandichavdi, South Arcot District, Tamil Nadu, a new wood was tentatively identified as *Mangifera*-like. The identification of another wood was confirmed with that of *Sterculia,* particularly with *Sterculia colorta.* The affinity of *Sapindoxylon indicum* Navale was revised which was found to be very similar to the modern wood of *Daubanga* of Sonneratiaceae.

A paper on two new fossil woods resembling *Chrysophyllum* and *Holoptelea* of Sapotaceae and Ulmaceae respectively was submitted for publication. Another paper comprising a revised account of *Hopeoxylon indicum* Navale and *Shoreoxylon speciosum* Navale, and a new wood resembling that of *Sindora* was finalized for publication.

5. 2. Sporae Dispersae and Palynostratigraphy

5. 2. 1. *Neogene Miospores of India*

A. The spores and pollen recovered from the Neyveli Lignite have been tentatively assigned to the families Lycopodiaceae, Schizaeaceae, Parkeriaceae, Polypodiaceae, Cyatheaceae, Gleicheniaceae, Palmae, Gramineae, Leguminosae, Anacardiaceae, Tiliaceae, Meliaceae, Polygonaceae, Onagraceae and Convolvulaceae.

B. A large number of pollen and spores from the Pliocene of Assam were studied and photographed. Their identification with the modern taxa is in progress.

C. In order to identify the fossil pollen and spores, the pollen grains of about 400 extant species belonging to the families Cruciferae, Fumariaceae, Nymphaeaceae, Meliaceae, Sapindaceae, Capparidaceae, Violaceae, Ochnaceae, Leguminosae, Rosaceae, Umbelliferae, Saxifragaceae, Combretaceae, Acanthaceae, Gentiaceae, Loganiaceae, Solanaceae, Convolvulaceae and Tiliaceae were studied, photographed and catalogued.

5. 2. 2. *Palynopetrographic Study of the Organic Remains in Coastal and Up-country Lignites*

A. Palynological study of the main seam of Neyveli Lignite has been completed.

B. Fifty two fresh samples of lignite from Neyveli have

been macerated, out of which 48 samples have yielded spores and pollen. Scanning of slides of 40 samples of 4 lateral sections have been completed. A preliminary analysis of the above mentioned samples show that the assemblage is comparatively rich in angiospermic pollen grains than the pteridophytic spores.

5. 2. 3. Compilation of the data collected on Neogene literature of the world for palynostratigraphic synthesis was continued.

5. 2. 4. *Palynological study of the Upper Cretaceous-Tertiary sediments of South Shillong Plateau*

Laboratory processing of rock samples collected from the Jadukata River, Mawphlong-Balat Road and adjoining sections was followed by taxonomic study of palynomorph assemblages. Study of microplanktons characteristic of Jadukata, Mahadeo and Langpar formations was completed and published. Spores and pollen grains have been tentatively identified. Preliminary analysis of the assemblages reveals a sharp palynological change between the Mahadeo and Langpar formations.

5. 2. 5. *Palynostratigraphy of Tertiary coals of Makum Coalfield, Upper Assam*

Morphotaxonomic description of the miospores from samples of various collieries of Makum Coalfield extended to specific level is being continued.

The assemblage is dominated by pteridophytic spores while angiospermic pollen are markedly deficient. Apart from this, many fungal and microplanktonic genera have also been recorded.

5. 2. 6. *Palynological study of the Tipam and Girujan sediments*

A. Girujan Clay Formation which forms a cap rock on the oil bearing sedimentary strata in Upper Assam has been differentiated into three distinct biozones on the basis of their characteristic spore pollen assemblages.

B. Girujan Clay and Tipam Sandstone formations have been palynologically demarcated at 2850 m depth in Kharsang well 2 of Arunachal Pradesh.

C. Repetition of Girujan Clay and Tipam Sandstone formations has been suggested on the basis of palynological studies in the subsurface sediments of the Great Nappe Region of Arunachal Pradesh.

D. Laboratory processing of sixty seven subcrop samples from Jorajan well 2 was completed. Fifty three flush samples from Kharsang well 2 of Arunachal Pradesh were also macerated for urgent stratigraphical dating.

E. Stratigraphical horizon of rock samples between 19—94 m depth of Kharsang well 3 was palynologically identified and reported to Oil India Ltd.

F. Sixteen samples from Kharsang well 3 have been macerated and microslides are being scanned. Scanning of microslides from other wells is also in progress.

G. In the Tertiary succession of Assam and neighbouring areas abound numerous costate spores which resemble the spores of living members of Schizeaceae and Parkeriaceae. They show great variation in morphological characters at different stratigraphic levels of this region. To assign these fossil spores to different taxonomic levels

variation pattern in the spores of living *Ceratopteris thalictroides* is being studied.

H. Thirty five samples from NHK 268 and 25 samples from Tarajan well 1 were processed chemically and the slides of the productive samples were made for further investigations.

5. 2. 7. *Resolution of the age of Barail equivalent rocks of Garo Hills*

A total number of 54 samples from Barail equivalent rocks of Garo Hills were chemically processed followed by microscopic examination of the palynological assemblages. Efforts to find guide fossils for the demarcation of different stratigraphic levels of the area were continued.

5. 2. 8. *Palynostratigraphy of the Lower Tertiary sediments of Simla Hills and near Jammu*

Palynomorph assemblages recovered from the Subathu-Dagshai sediments represented along the Kalka-Simla Highway section have been extensively scanned, photomicrographed and catalogued for taxonomic studies. Morphological study together with remarks on the palaeoecological significance of the genus *Pediastrum* has been completed. Specimens of bicavate cysts have been studied in detail, on the basis of which two new genera, organizationally similar to *Thalassiphora*, have been established. Analysis of distinct palynomorph-complexes shows that it is possible to identify palynologically the Lower-Middle and top of the Subathu Formation as well as the base of the overlying Dagshai Formation.

5. 2. 9. *Palynostratigraphy of the Eocene sediments of Kutch*

Taxonomic and morphologic study of the palynomorphs recovered from the Harudi Formation has been continued. 30 samples from Wagapathar and Sarangwara areas were macerated of which 8 samples proved to be positive. The important palynological taxa have been identified. This assemblage is closely correlatable to those of Panandhro and Akri regions.

5. 2. 10. *Palynostratigraphy of Madh and Kakdi formations around Matanomadh, Kutch*

Finalization of manuscripts dealing with the palynology and stratigraphy has been continued. Stratigraphically located samples from other sections in Kutch have been collected with a view to observe the lateral persistence of 4 biozones away from the type area. 25 samples from Jhulerai have been macerated, of which 8 samples have yielded fossils. The identification of the sporomorphs is being continued.

5. 2. 11. *Palynostratigraphy of Marine Cretaceous-Tertiary sedimentary rocks near Pondicherry, Tiruchirapalli and Quilon*

Twenty stratigraphically located rock samples collected from Pondicherry, Kunnum and Gurdamangalam sections were chemically processed for the recovery of spores, pollen grains, dinoflagellates and diatoms.

Taxonomic study of Dalmiapuram dinoflagellates has been nearly completed. Microphotography of additional microplanktons from Dalmiapuram Formation not reported earlier has been completed. The detailed study of the composite dinoflagellate assemblage now studied suggests reassessment of the age of Dalmiapuram grey shale.

Morphology of Edvai dinoflagellates was continued.

5. 3. Tertiary from Abroad

5. 3. 1. About a dozen fossil woods from the Tertiary of Burma were studied and some of them were assigned to *Careya*, *Albizia*, *Swintonia*, *Lagerstroemia*, *Terminalia*, *Shorea*, *Dipterocarpus* and to Araucariaceae.

5. 3. 2. The study of fossil woods from the Tertiary of Thailand was completed. The woods identified belong to *Millettia-Pongamia*, *Cynometra*, *Afzelia-Intsia*, *Anogeissus* and to Sapotaceae. A paper on these woods is ready for publication.

5. 3. 3. Fossil woods from the Tertiary of Ethiopia were investigated. Most of the woods have been identified as belonging to the genera *Ochrocarpus (Mammea)*, *Cassia*, *Vitex*, *Stereospermum* and *Neoboivinella* of the families Guttiferae, Leguminosae, Verbenaceae, Bignoniaceae and Sapotaceae respectively.

6. QUATERNARY

6. 1. Plant megafossils from Karewa beds of Kashmir

A collection of fossil leaves from the Lower Karewa beds of Laredura was examined. The leaves were found representing the genera *Pinus*, *Quercus*, *Betula*, *Rosa*, *Pyrus*, *Rubus*, *Cotoneaster*, *Parrotia*, *Desmodium*, *Berberis*, *Salix*, *Ulmus*, and *Ficus*. Out of these, a few appear to be new which are being studied in detail.

6. 2. Pollen Morphology

6. 2. 1. *Rajasthan pollen flora*

Three hundred and fifteen pollen slides of 158 species belonging to 85 genera were prepared and pollen morphology of one hundred plant species of 46 genera among

them was investigated. A workable key of two hundred plant species belonging to 108 genera was prepared in order to facilitate the identification of sub-fossil pollen and spores in the sediments. Microphotography of Rajasthan pollen flora was undertaken and pollen of 5 spp. has so far been photographed.

6. 2. 2. *Nepal pollen flora*

Two hundred and fifty pollen slides belonging to 70 spp. of 40 genera were prepared. A broad workable pollen key of the pollen grains so far processed and studied was prepared in order to facilitate the identification of sub-fossil pollen and spores from the Nepal profiles.

6. 2. 3. *Nilgiris pollen flora*

Fifty plant species of 15 genera characteristic of shola forest were investigated palynologically from the published literature and from the prepared slides available at the Institute's Herbarium.

6. 2. 4. *Palynology of Sapotaceae and Symplocaceae*

A detailed pollen morphological study of 40 Indian spp. (23 spp. of *Symplocos* and 17 spp. distributed over 9 genera of Sapotaceae) was completed. A workable pollen key was also prepared in order to identify sub-fossil pollen grains in the Indian Quaternary sediments. Photography of about 20 spp. was completed.

6. 2. 5. *Pollen morphology of Mimosa rubicaulis and M. hamata*

Detailed pollen morphological study of these two species was done from fresh collections (two specimens of *M. hamata* and 4 of *M. rubicaulis)*. The study has revealed

that the polyads of two species can not be distinguished from one another owing to much overlap in their morphological characters. A paper entitled "Pollen morphology of *Mimosa rubicaulis* and *M. hamata*" was prepared for publication.

6. 2. 6. *Palynology of Cedrela toona*

The pollen slides of 34 polleniferous specimens of *Cedrela toona* collected from different parts of the country and the material given by the Forest Research Institute for study were prepared.

6. 2. 7. *Pollen card Index*

1799 Index cards recording the pollen diagnoses of the Indian modern flora from various journals were prepared.

6. 3. Pollen analysis

6. 3. 1. *Pollen zonation scheme for Western Himalaya, Rajasthan and Nilgiris*

Kashmir Valley—Out of 26 samples collected from the lower part of the Karewa Formation in the Hirpur area, Shopian region, 14 samples were macerated and examined. Only sample no. 16 comprising greyish clay and sample no. 26 comprising dark clay from the lower part of the Karewa succession yielded pollen grains. Studies of modern pollen of Pinaceae, Gnetaceae and Cyperaceae were undertaken for comparative purposes.

Fifteen soil samples collected from Burzahom, an archaeological site near Srinagar, were pollen analysed and found palynologically barren.

6. 3. 2. *Garhwal Himalaya*

Four moss cushions collected last year from Muthronwala Swamp forest about 7 km from Dehradun town at a height of about 800 m were pollen analysed. Pollen grains of *P. wallichiana* (dominant), *Picea*, *Quercus*, *Alnus*, Compositae, Euphorbiaceae, Gramineae (codominant), Cyperaceae, Cheno/Ams. etc. were found in them.

The pollen analysis of fifteen peaty clay samples from Sankhu in the Kathmandu Valley was completed. The results reveal dominance of Chir pine and grass pollen. The other constituents include pollen grains of blue pine, spruce, fir, oaks, birch, sedges, Cheno/Ams., *Artemisia* etc.

The Manihara and Kalimatti pollen diagrams (cf. report of the last year) are dated by radio-carbon from 15,300 B. C.-9,880 B. C., i. e. corresponding with the Weichselian times. The description of these profiles was also undertaken.

6. 3. 3. *Rajasthan*

A. The published results from Rajasthan were re-examined in the light of availability of vegetational survey of Rajasthan by the French Institute, Pondicherry. The re-examination of data have not allowed inference of a humid phase during the Holocene rather the time period 5000-3000 B. P. was characterised by intense aolian activity. The lakes were moderately saline to begin with and had probably risen once during 6000-5000 B. P.

B. Five samples from a profile from Budha Pushkar Lake were pollen analysed and the important taxa recovered from the sediment were Gramineae, Cyperaceae, Liliaceae, *Typha*, *Utricularia* etc.

6. 3. 4. *Gangetic Plain*

Three metre deep profile from the Horse shoe Lake Mandhata, District Pratapgarh was pollen analysed. Owing to the paucity of pollen grains in the samples several slides for each sample were counted to obtain the total pollen sum above 200. The important taxa identified include *Anogeissus, Tecomella, Tribulus, Olea, Macrotomia, Prosopis, Convolvulus, Potamogeton, Nymphaea,* Cyperaceae and Liliaceae. Three size groups of grass pollen were recognised : (1) psilate, 50 μ m and above; (2) granulate 40 μ m; and (3) 25 μ m.

The pollen diagram has been constructed and the samples are awaiting radio-carbon determination.

The zone I at the base of pollen diagram is characterised by the open grass lands with a few shrubby members of Malvaceae and Rosaceae; zone II by the establishment of tropical dry deciduous savannah forest comprising *Anogeissus, Tecomella, Prosopis* and *Phyllanthus*; and zone III by the declining trend in the tree vegetation. There is evidence of rapid silting of the upper portion of the profile. No major climatic change could be observed except for the climatic remained warm throughout. The cerelia type pollen and other culture pollen start from the middle of zone II and attain high frequencies in zone III.

6. 3. 5. *Gujarat*

A. The 6 m deep pollen profile from the brackish water shallow Nalsarovar Lake about 60 km south-west of Ahmedabad and supported by eleven C–14 dates reveals the Holocene history of grassland–Chenopod savannah in the vicinity of the lake. Pollen frequency of chenopods shows a declining trend from the beginning of the Holocene to 3500 B. P. and among the arboreals that of *Holoptelea*

integrifolia shows a rising trend until 4000 B. P. and then it declines.

Three episodes of estuarine conditions as revealed by the high frequencies of microforaminifera have been observed in the history of lake, first, before 7000 years B. P. ; second, between 5000 to 4000 B. P. and the third dates to 160 years B. P.

B. A paper on some fungal spores from Quaternary deposits of Malvan, Gujarat was finalized and submitted for publication. The genera reported are *Tetraploa, Alternaria, Helminthosporium, Curvularia, Hormischium, Torula,* and *Puccinia.*

6. 3. 6. *Bengal Basin*

Modern pollen sedimentation from sea to inland has been studied through pollen analysis of 10 surface samples from an area about 8 km inland extending from Bogkhali near sea shore to Fraizerganj. About 25% of modern taxa are represented in these pollen spectra.

Fifty one samples of the 6.6 m deep profile from Kolara near Hoogli River were pollen analysed. Quite good frequencies of pollen grains have been recovered except for the upper alluvial sediment. The important taxa recovered include mangrove plants, sedges, grasses and aquatics such as *Typha, Potamogeton,* etc. Pteridophytic spores both monolete and trilete are quite abundant. Although the pollen diagrams are yet to be prepared, the analysis reveals high frequencies of pollen of mangrove plants in the upper half of the profile only. The uppermost alluvial deposit has been found without pollen. The bottom samples though poor in pollen suggest fresh water conditions inundated by brackish water in the upper part of

the profile where high frequencies of pollen of mangrove plants have been encountered.

Two bottom samples of about 3 m deep profile Chaltiya in Barind jungles were found to be barren palynologically.

6. 4. Archaeobotany

6. 4. 1. *The origin of Peasantry in India*

The paper deals with the concepts and their application to the Indian sub-continent drawing attention to the niches deserving attention.

6. 4. 2. *Neolithic and Chalcolithic Plant Economy*

A. *Koldiwah, Allahabad*

Several Neolithic and Chalcolithic potsherds from this site dating from prior to 6480 $\pm$ 185 B. P. on examination revealed the presence of impressions and compressions of several rice spikelets embedded in clay. An attempt was made to identify the rice imprints on these potsherds and this has involved study of world collection of several species of wild and cultivated rices. Apart from several minor characters, the major character that has proved to be of great use in distinguishing the wild and cultivated rices is the ornamentation pattern over the lemma and palea. Several species of wild and cultivated rices have also been photographed.

B. *Tekkalkota, Bellary*

In the layer 2 at a depth of one foot in Trench A, Locus GWD, carbonised seeds of *Phaseolus vulgaris* and *Dolichos biflorus* have been recognized. The layer 2 at 2′ 4″ in Trench 2, Locus II has yielded abundance of

Phaseolus vulgaris together with *Dolichos biflorus* and *Ziziphus nummularia*, whereas at 2'9" in the same layer *Lathyrus sativus, Dolichos biflorus* and *Phaseolus vulgaris* have been found.

About 22 charcoal samples from Tekkalkota, each sample containing several charcoals, were sectioned in all the 3 planes, *viz.*, T. S., T. L. S. and R. L. S. and some of these charcoals have provisionally been identified.

C. *Ahar, Rajasthan*

About two charcoal samples each containing several charcoals were sectioned in all the 3 planes, *viz.*, T. S., T. L. S. and R. L. S. and have been tentatively identified.

6. 4. 3. *Harappan Plant Economy*

A. *Kalibangan, Rajasthan*

Several charcoals from the remaining 8 samples from Kalibangan were processed and blocks prepared. All the 29 samples of charcoals containing several charcoals were sectioned in all the three planes, *viz.*, T. S., T. L. S. and R. L. S. and permanent slides were prepared. Some of these charcoals were also identified.

B. *Rojdi, Saurashtra*

Several charcoals in 2 samples were sectioned in all the three planes, *viz.*, T. S., T. L. S. and R. L. S. and permanent slides prepared.

6. 4. 4. *Early to Late Historic Plant Economy*

A. *Jodhpura, Jaipur*

The bricks and clay pieces recovered from this archaeo-

logical site have been found to contain compressions of cultivated rice *(Oryza sativa)*.

B. *Rupar, Ambala*

From one sample bearing T. F. No. 221 large quantity of shot wheat *(Triticum sphaerococcum)* and possibly *Paspalum* sp. also have been recognised.

C. *Kalsi, Dehra Dun*

A few burnt brick samples when examined revealed impressions and compressions of rice spikelets. Anatomical studies of these burnt spikelets revealed in addition to the chess-board pattern, also the typical epidermal cells of rice.

7. QUATERNARY FROM ABROAD

7. 1. Central Himalaya, Nepal

Pollen spectra were constructed of 30 modern surface samples including moss cushions collected from Gokarna Forest, Pashupati Reserve Forest, Gaurighat, Gajeshwari, Sankhu, Godavari, Navdhara, etc. All the pollen spectra were arranged in composite diagram. The results reveal dominance of Chir-pine pollen in pollen spectra from the first four sites; of *Alnus* in those from the remaining sites ; of oak pollen in pollen spectra collected from within and in the vicinity of the Oak forest.

8. RADIOCARBON DATING LABORATORY

8. 1. Radiocarbon Dating

The electronics units and some of the glass apparatus required for the laboratory were obtained and set-up in

August, 1975. Nearly 80 samples were chemically processed by different methods, methane was synthesized in each case and the yield was determined. The radioactive counting of the samples could be carried out only after the construction of the shield in December, 1975. About 50 samples of methane from anthracite coal (background) and modern standard (contemporary C-14 standard oxalic acid) were assayed to determine the background and standard counting rates and contamination, if any, in processing. The procedures of handling and pre-treatment of samples and chemistry methods are also standardised in order to get reliable results. After completing all the tests, the laboratory became operational in January, 1976. Ten intercomparison samples of different ages have been measured and the ages obtained were compared with the determinations made else where. The agreement has been very good. Some peat and soil samples collected by the Quaternary Department have been taken up for regular dating work.

A report on the Radiocarbon Dating Program of the Institute was presented at the International Conference on Low Radioactivity Measurements and Applications held at High Tatras, Czechoslovakia, October 6-10, 1975.

A second counting set up for Radiocarbon Dating work has been planned and the work is in progress. The Quartz Counter for small samples will be assembled soon. The electronics units for this counter are being assembled. Since the samples to be submitted for dating work by the Quaternary Department will be predominantly of clay and soil poor in organic matter, various methods of extraction of organic carbon suitable for age determination are being tried out.

8. 2. Fission Track Dating

The work on this project has been started very recently. The methods of developing tracks in apatite and zircon crystals, track density measurements etc. are being taken up to get this dating method established here. An attempt was made to develop the tracks resulting from the solid state damage due to the traversal of fission fragments from spontaneous fission of U^{238} in apatite crystals. The polished crystals of apatite were mounted using epoxy resin and etched in 5% HNO_3 for 1 minute at room temperature. Very well developed tracks were observed when the crystals were viewed under the microscope. Further work is in progress.

8. 3. Glass Blowing Shop

High vacuum stop cocks required for the laboratory have been made and a reserve stock has also been built up. Vacuum distillation apparatus for mercury was constructed and operated to obtain clean mercury for shield and manometers. A vacuum system with diffusion pump etc. was built for testing purpose. Modifications in the combustion, methane extraction and counter filling systems were made to improve the operations.

8. 4. Workshop

The workshop has been able to provide valuable assistance in the maintenance of mechanical gadgets and construction of simple equipments needed by the laboratory.

III. PAPERS PUBLISHED

Awasthi, N. (1975). *Millettioxylon indicum* Awasthi, a fossil wood of Leguminosae from the Cuddalore Series of South India. *Palaeobotanist.* **22** (1) : 47-50.

Idem (1975). Revision of some dicotyledonous woods from the Tertiary of South India. *Ibid.* **22** (3) : 186-191.

Banerji, Jayasri & Maheshwari, Hari K. (1975). Palynomorphs from the Panchet Group exposed in Sukri River, Auranga Coalfield, Bihar. *Ibid.* **22** (2) : 158-170.

Bharadwaj, D. C. (1975). Palynology in Biostratigraphy and Palaeoecology of Indian Lower Gondwana Formations. *Ibid.* **22** (2) : 150-157.

Idem (1975). A classification of sporae dispersae. *Geophytology.* **5** (1) : 81-91.

Bose, M. N. (1975). A palynological reconnaissance of the Mesozoic sediments of Zaire. *Acad. Roy. des. Sci., D'Outre-Mer Bull. des. Sci.* **4** : 618-628.

Idem (1975). *Araucaria haastii* Ettingshausen from Shag Point New Zealand. *Palaeobotanist.* **22** (1) : 76-80.

Bose, M. N. & Kar, R. K. (1975). Palynologic correlation of the Lukuga Series, Zaire. *Rev. Espanola Micropaleontologia.*

Idem (1975). Palynologic correlation of the Lukuga Series, Congo. *Proc. Afr. Colloq. Micropalaeont.* **5** : 113-129.

Bose, M. N., Maheshwari, H. K. & Kumaran, K. P. N. (1976). Mesozoic *Sporae dispersae* from Zaire—The Loia Series in the Samba bore-hole. *Abst. 7th Afr. Micropaleont. Collq. Ile-Ife.*

Cross, A. T. & Singh, H. P. (1975). Indicators of Palaeoenvironments of Upper Cretaceous coals. *Bull. geol. Soc. America.* **7** (7) : 10-42.

Godwin, H. & Vishnu-Mittre (1975). Studies of the post-glacial history of British vegetation. XVI Flandrian deposits of the fenland margin at Holme Fen Whittlesey Mere, Hunts. *Phil. Trans. R. Soc.* **270** (909) : 561-608.

Gupta, H. P. (1975). History of fossil legumes in India. *Geophytology*. **5** (1) : 1-9.

Jain, K. P. & Millepied, P. (1975). Cretaceous Microplankton from Senegal Basin, W. Africa. Pt. II. Systematics and biostratigraphy. *Ibid.* **5** (2) : 126-171.

Jain, K. P., Sah, S. C. D. & Singh, R. Y. (1975). Fossil Dinoflagellates across Maestrichtian-Danian boundary in Lower Assam. *Palaeobotanist*. **22** (1) : 1-18.

Kar, R. K. & Jain, K. P. (1975), Libya—a probable part of Gondwanaland. *Geophytology*. **5** (1) : 72-80.

Khandelwal, A. & Vishnu-Mittre (1975). Palynology of *Holoptelea integrifolia*. *Palaeobotanist*. **22** (2) : 127-132.

Lakhanpal, R. N., Guleria, J. S. & Awasthi, N. (1976). A podocarpaceous wood from the Pliocene of Kutch. *Geophytology*. **5** (2) : 172-177.

Lakhanpal, R. N., Prakash, U. & Bande, M. B. (1976). An angiospermous inflorescence from the Deccan Intertrappean Series of India. *Geophytology*. **5** (2) : 229-230.

Lele, K. M. (1975). Studies in the Talchir Flora of India—10. Early and Late Talchir microfloras from the West Bokaro Coalfield, Bihar. *Palaeobotanist*. **22** (3) : 219-235.

Maithy, P. K. (1975). Some contributions to the knowledge of Indian Lower Gondwana ferns. *Ibid.* **22** (1) : 29-38.

Idem (1975). Micro-organisms from the Bushimay system (Late Pre-Cambrian) of Kanshi, Zaire. *Ibid.* **22** (2) : 133-149.

Maheshwari, Hari K. (1975). Palynology of the Athgarh Formation near Cuttack, Orissa. *Ibid.* **22** (1) : 23-28

Idem (1975). Palynology of Mesozoic Gondwanas of India. *Abst. VIII Int. Carb. Cong* . Moscow : 119.

Idem (1975). Floristics of the Upper Palaeozoic and Lower Mesozoic Gondwanas of India. *Proc. XII Int. bot. Cong.* Leningrad.

Idem (1975). Miofloras south of the Tethys. *Palaeobotanist.* **22** (3) : 236-244.

Maheshwari, Hari K. & Banerji, Jayasri (1975). Lower Triassic palynomorphs from the Maitur Formation, West Bengal, India. *Palaeontographica.* **152B** : 149-190.

Maheshwari, Hari K. & Meyen, S. V. (1975). *Cladostrobus* and the systematics of cordaitalean leaves. *Lethaia.* **8** : 103-123.

Prakash, U. (1975). Phytogeographic evolution of Guttiferae and its bearing on the past climate. *Palaeobotanist.* **22** (1) : 63-75.

Idem (1975). Fossil woods from the Lower Siwalik beds of Himachal Pradesh, India. *Ibid.* **22** (3) : 192-210.

Prakash, U. & Tripathi, P. P. (1975). Fossil dicotyledonous woods from the Tertiary of Eastern India. *Ibid.* **22** (1) : 51-62.

Singh, H. P., Singh, R. Y. & Sah, S. C. D. (1975). Palyno-

stratigraphic correlation of the Palaeocene subsurface assemblages from Garo Hills, Meghalaya. *J. Palynol.* **11** (1) : 43-64.

Singh, R. Y. (1975). Morphological study of the *Retialetes* complex from Indian Tertiaries. *Geophytology.* **5** (1) : 98-104.

Srivastava, Shyam C. (1975). A new microsporangiate fructification from the Triassic of Nidpur, India. *Palaeobotanist.* **22** (1) : 19-22.

Tiwari, R. S. & Schaarschmidt, F. (1975). Palynological studies in the Lower and Middle Devonian of the Prum Syncline, Eifel (Germany). *Abh. senchkenb. naturforsch ges.* **534** : 1-29.

Vishnu-Mittre (1975). Studies of fungal remains from the Flandrian deposits in the Whittlesey Mere region, Hunts., England. *Palaeobotanist.* **22** (2) : 89-110.

Idem (1975). Twenty five years progress in the history of biological sciences in India. *Geophytology.* **5** (1) : 43-50.

Vishnu-Mittre & Guzder, S. (1975). The early domestication of plants in south and southeast Asia—A critical review. *Palaeobotanist.* **22** (2) : 83-88.

Idem (1975). Stratigraphy and Palynology of the Mangrove Swamps of Bombay. *Ibid.* **22** (2) : 111-117

Vishnu-Mittre & Khandelwal, A. (1975). Air borne pollen grains and fungal spores at Lucknow during 1969-70. *Ibid.* **22** (3) : 177-185.

Vishnu-Mittre & Savithri, R. (1975). Supposed remains of Rice (*Oryza* sp.) in the Terracotta cakes and Pai

at Kalibangan, Rajasthan. *Ibid.* **22** (2) : 124-126.

Vishnu-Mittre & Sharma, Chhaya (1975). Pollen analysis of the salt flat at Malvan Gujarat. *Ibid.* **22** (2): 118-123.

IV. FIELD WORK

1. Two members of the Palaeozoic Department visited (i) Pachwara Coalfield, (ii) Mahuazarhi Coalfield, (iii) Barjora Coalfield, and (iv) Raniganj Coalfield for the collection of megafossils and palynological samples of Permian age. In addition to this fossil collections were made from the Jurassic of Amarjola (Rajmahal Hills) and fossil woods from the Bolpur of Miocene age.

2. Four members of the Palaeozoic Department visited (i) Chichai fall, Rewa for collection of Vindhyan rock samples (ii) Chandrapura and Nagpur for collection of megafossils from the Kamthi Formation.

3. One member of the Palaeozoic Department visited the Hutar Coalfield for (i) measuring stratigraphical sections of the Lower Gondwana formations and (ii) collection of palynological samples from measured sections. Some megafossils have also been collected.

4. Two members of the Mesozoic Department went on a field trip to collect plant megafossils and samples for palynological studies from the upper Jurassic and Lower Cretaceous beds of Gujarat from 25 December, 1975 to 18 January, 1976.

5. One member of the Mesozoic Department visited some of the Upper Gondwana localities of the South Rewa Basin from 12 March to 1 April, 1976 and collected a large number of megafossils and samples for palynological study.

6. Two members of the Cenozoic Department went on an excursion to Kashmir in October, 1975. They collected fossil plants from the Lower Karewas exposed near Gulmarg, Tangmarg and Laredura, District Baramula. They also made a survey of the Upper Karewas exposed along the National Highway near Pampur.

7. One member of the Cenozoic Department went on an excursion to Kutch during December—January, for collection of fossil plants. He made a rich collection of fossil woods from the Pliocene of Dhaneti and Mothala, and leaf-impressions from Matanomadh, Panandhro and Khari River beds near Goela—Mokara.

8. Two members of the Cenozoic Department visited Forest Research Institute, Dehra Dun in March, 1976 to consult the Herbarium and Xylarium for identification of fossil plants. Two other members of the Cenozoic Department also left for Dehra Dun on 30 March, 1976 for consultation of Herbarium and Xylarium.

One member visited lakes in the Pratapgarh District for collection of material in the month of April, 1975.

One member visited Rajasthan to collect polleniferous material from the Herbaria of the Central Arid Zone Research Institute and from Jodhpur University in April, 1975.

One member visited Kashmir Valley to study stratigraphy and to collect material from the Lower Karewa deposits in October, 1975.

Two members visited Ootacamund in Nilgiris to collect soil profiles in March/April, 1976.

One member visited Saurashtra coast to study the geomorphological features in March/April, 1976.

9. Two members of Coal Department visited various areas in the Satpura Gondwana Basin (January—February, 1976) for collection of coal and carbonaceous shales samples for palynostratigraphic studies.

10. Two members of Coal Department visited Makum coalfield area for geological mapping. Collected samples of Baragolai Stage for palynological study from Namdang River Section. Also collected bore-core samples from Dilli Colliery area for palynological study.

11. A member of Oil Palynology Department collected living plants of *Ceratopteris thalictroides* together with their sporiferous material from the neighbourhood of Calcutta and Gauhati. Plants belonging to the following families were also collected : Parkeriaceae, Acanthaceae, Convolvulaceae, Cyperaceae, Verbinaceae, Rubiaceae, Compositae, Polygonaceae, Onagraceae, Pontederiaceae, Scrophulariaceae and Hydrophyllaceae.

12. Field excursion to Cauvery Basin and Western Ghats was undertaken by members of Oil Palynology Department from 1 February to 11 March, 1976 to collect stratigraphically localities near Pondicherry, Ariyalur, Virdhachalam, Kallakudi, Uttatur, Varkala, Edvai representing Cretaceous-Tertiary formations.

13. Two members of Oil Palynology Department visited Kutch during December—January (1975-76) and collected palynological samples from measured sections near Babia Hills, Fulra, Umarsar, Ber Mota, Waitor, Wagapathar and Sarangwara and adjacent localities.

14. Three members of the Oil Palynology Department visited Simla Hills during March—April, 1976 and collected palynological samples from measured sections near Barog,

Kumarhatti, Dagshai, Dharampur, Jabli, Koti, Subathu and Baroti. Field work was also extended to the subsidiary Nala sections so as to trace the lateral extension of the rock units. The area around Dharampur was also mapped.

V. SPONSORED/COLLABORATIVE RESEARCH

A. Mesozoic Department

The collaborative work with the Indian Statistical Institute on the mega and micro-plant remains from the Jurassic of Central India is under progress.

The collaborative project with the O. N. G. C., Jodhpur on the Jurassic plant megafossils from the Jaisalmer Basin has been completed.

B. Cenozoic Department

The study of fossil woods from the Tertiary of Blue Nile and Desi, Ethiopia was continued with Professor Y. Lemoigne, University of Lyon, France. A paper comprising some dicotyledonous woods is being completed.

C. Coal Department

Geological Survey of India, Coal Survey Laboratories, N. C. D. C. and N. L. C. organizations.

D. Oil Department

(i) Palynostratigraphical studies of the Tertiary surface and subsurface rocks of Upper Assam (Project supported by Oil India Ltd., Duliajan, (Assam).

(ii) Biostratigraphic studies of the sedimentary succession of Meghalaya—1. Stratigraphic resolution of Komarah Basin on the basis of microfossils (Project in collaboration with Directorate of Mineral Resources, Meghalaya).

(iii) Biostratigraphical studies of phytoplankton in the marine Tertiaries of Kutch and adjoining areas (in collaboration with Geology Department, Lucknow University, Lucknow).

(iv) Palynostratigraphic studies of Lower Tertiary rocks of northern India (in collaboration with Geological Survey of India).

VI. TRAINING PROVIDED TO OUTSIDERS

1.	Mr. M. D. Kajale	Deccan College, Poona.
2.	Mr. Ashok Jain	Botany Department, Jiyaji College, Gwalior.
3.	Mr. B. N. Saxena	Botany Department, Lucknow University, Lucknow.
4.	Miss Farzana Parveen	Botany Department, Jodhpur University, Jodhpur.
5.	Sri Tirlochan Singh	Wadia Institute of Himalayan Geology, Dehra Dun
6.	Sri M. S. Rawat (Asstt. Professor)	Botany Department, Degree College, Sehore, M. P.
7.	Miss Geeta Desai	M. S. University, Gujarat.
8.	Mr. B. P. Patra	Utkal University, Bhubaneswar.

VII. TECHNICAL ASSISTANCE TO OUTSIDERS

1. Neyveli Lignite Corporation of India.

2. Department of Ancient Indian History, Culture and Archaeology, University of Allahabad.

3. Archaeological Survey of India.

4. Directorate of Archaeology and Museum, Hyderabad (A. P.).

5. Forest Research Institute, Dehra Dun.

6. Dr. J. A. Lowe, Department of SSEAS, University of California, Berkeley, U. S. A.

7. Oil India Ltd., Duliajan, Assam.

8. Directorate of Mineral Resources, Government of Meghalaya.

9. Geological Survey of India (Himachal Pradesh Circle).

10. Prof. Y. Lemoigne, University of Lyon, France.

11. Mr. J. P. Misra, B. S. N. V. Degree College, Lucknow.

VIII. PAPERS AND LECTURES AT SYMPOSIA/ CONFERENCES/MEETINGS

Palaeopalynology as a parameter in biostratigraphy.	D. C. Bharadwaj	Key note address to the 5th Ind. Colloquium of Micropalaeontology.
Role of palynology in Coal industry.	,,	Invited lecture Coal India Ltd., Margareta, Assam.
Palynological correlation of coal seams in	D. C. Bharadwaj	1st Indian Geophytological Conference

Kusmunda Block, Korba Coalfield, M. P.	& S. C. Srivastava	held at Lucknow.
Spore-pollen assemblage from Zirab Coalfield, Iran	D. C. Bharadwaj & Pramod-Kumar	,,
Statistical approach to the circumscription of species in *Sporae dispersae*.	D. C. Bharadwaj & Archana Dwivedi	,,
Lower Gondwana "Composite genetic coal types" of India.	G. K. B. Navale	Invited paper presented in the VIIIth Int. Congr. Carb. Stratigr. & Geol. Moscow, USSR.
Nomenclature and Analysis of Gondwana coals.	,,	Invited lecture presented in the I. C. C. P. meeting, Moscow, USSR.
Biopetrology of Kargali seam, East Bokaro coalfield, Bihar.	,,	1st Indian Geophytological Conference held at Lucknow.
Three new species of *Ptilophyllum* from Bansa, M. P.	Sukh-Dev & Zeba-Bano	Indian Geophytological Conference, Lucknow.
Mesozoic *sporae dispersae* from Zaire—The Loia Series in the Samba Bore-hole.	M. N. Bose., H. K. Maheshwari & K. P. N. Kumaran	7th African Micropalaeontological colloquium, Ile—Ife (Nigeria)

Further contribution on Protohistoric Ragi, *Eleusine* Coracana, Gaerth.	R. Savithri	1st Indian Geophytological Conference December, 1975, Lucknow.
Pollen morphology of *Mimosa rubicaulis* Lamk. and *Mimosa hamata* willd.	A. K. Saxena & Vishnu-Mittre	,,
The environment of early man in North-west India.	Vishnu-Mittre	Congress of Archaeological and Anthropological Sciences Seminar on Early man in India Dec. 1975, Punjab University, Chandigarh.
Problems and prospects of palaeobotanical approach towards the investigation of the history of the Rajasthan Desert.	,,	Seminar on Problems of the Desert in India, Geological Survey of India, Jaipur.
The origin of Peasantry in India.	,,	Seminar on Peasant Society in India, Department of Anthropology, Lucknow University, Lucknow, Feb. 76.
Indian cultivated plants in space and time.	,,	Botany Department, Annamalai University Chidambaram.

Cereals in space and time	Vishnu-Mittre	Institute Francaise Pondicherry.
Setaria italica new Cereal in Ancient plant economy of India	Vishnu-Mittre & R. Savithri	1st Indian Geophytological Conference December, 1975, Lucknow.
Pollen studies at Nal Lake (Nalsarovar) Gujarat.	Vishnu-Mittre & Chhaya Sharma	,,
Palaeoclimatic implications of Gondwana floras.	K. M. Lele	,,
Palaeobotanical evidence on the presence of Karharbari Stage in the Auranga Coalfield.	A. K. Srivastava	,,
Our planet earth and the early life.	P. K. Maithy	Acharya Narendra Dev Mahila Mahavidyalaya Kanpur.
Plant fossils in the rocks of Rajmahal Hills.	,,	Symposium on the Geology of Rajmahal Hills: Sahibganj College, Sahibganj.
Palaeozoic *Sporae dispersae* from Saire-Core samples from Dekese bore hole.	R. K. Kar	VII African Micro-palaeontological Colloquium held at Ile-Ife, Nigeria.
Microfloristic evidences for climatic vicissitudes in India during Gondwana.	,,	1st Geophytological Conference, Lucknow.

Stratigraphical position of the Mikir Formation.	S. C. D. Sah, R. Y. Singh & N. C. Mehrotra	1st Geophytological Conference, Lucknow.

IX. REPRESENTATION ON COMMITTEES/BOARDS

R. N. Lakhanpal	...	Member, Editorial Board, The Palaeobotanist. Member, Apex Committee, IV I. P. C. Editor, Catalogue of Indian Fossil Plants.
D. C. Bharadwaj	...	Vice-President, International Commission on Palynology. Chairman, Organizing Committee, IV I. P. C. Member, IV International Commission on Carboniferous Stratigraphy. Member, Editorial Boards of "Review Palaeobotany and Palynology", Palaeobotanist and Geophytology.
M. N. Bose	...	Member, Editorial Board, Palaeobotanist. Member, Apex Committee, IV I. P. C.
Vishnu-Mittre	...	Member, Central Advisory Board of Archaeology, Govt. of India. Member, Apex Committee for the IV I. P. C. Vice-Chairman, Organizing Committee, IV I. P. C.

		Member, Palaeobotanical Society.
S. C. D. Sah	...	Secretary-General, Organizing Committee, IV I. P. C. Treasurer, College of the Fellows of the Palynological Society of India. Founder Member, College of the Fellows of the Palynological Society of India. Foundation Fellow, Indian National Earth Sciences Academy, Calcutta.
K. M. Lele	...	Joint Secretary-General, Organizing Committee, IV I. P. C. Member, Apex Committee, IV I. P. C. Member, Programming and Editorial Committee, IV I. P. C.
U. Prakash	...	Chief Editor, Geophytology. Joint Secretary, Apex Committee, IV I. P. C.
G. K. B. Navale	...	Member, International Committee of Coal Petrology. Member, Special Committee "Gondwana Coal" of International Coal Petrology. Member, International Commission of Coal and Lignite Nomenclature.

		Member, International Commission of Coal and Lignite Analysis.
		Member, Organizing Committee of Indian National Committee of Coal Petrology.
		Secretary, Organizing Committee, IV I. P. C.
H. P. Singh	...	Secretary, Organizing Committee, IV I. P. C.
		Joint Secretary, The Palaeobotanical Society (w. e. f. January, 1976).
		Member, Editorial Committee, IV I. P. C.
		Member, Committee of Bibliography of Indian Palynology.
K. P. Jain	...	Editor, Geophytology (till December, 1975).
		Secretary, Organizing Committee, IV I. P. C.
		Member, Executive Committee, The Palaeobotanical Society (till December, 1975).
Sukh-Dev	...	Member, Executive Committee, The Palaeobotanical Society.
P. K. Maithy	...	Member, Executive Committee, The Palaeobotanical Society.
		Editor, Geophytology.
H. K. Maheshwari	...	Member, Committee for Fossil Plants, International Association for Plant Taxonomy.

		Editor, Catalogue of Indian Fossil Plants. Additional Secretary, Organizing Committee, IV I. P. C. Division Secretary, IV I. P. C., Division V, Palynological Data Handling and Methodology Member, Publicity and Press Committee, IV I. P. C. Member, Editorial Sub-committee, IV I. P. C. Incharge, Publication Committee, IV I. P. C.
R. S. Tiwari	...	Member, Editorial Board "The Palaeobotanical Society." Additional Secretary, Organizing Committee, IV I. P. C.
R. K. Kar	...	Assistant Secretary, Organizing Committee, IV I. P. C. Foundation Fellow, Indian National Earth Sciences Academy, Calcutta. Member, International Geological Correlation Programme, African Micropalaeontological Colloquium.
N. Awasthi	...	Editor, Catalogue of Indian Fossil Plants. Member, Publication Committee (Pre-Conference), IV I. P. C.

H. P. Gupta	...	Additional Secretary, Organizing Committee, IV I. P. C. Member, Bibliography of Quaternary Palynology, Indian Palynological Society, Lucknow. Member, Publication Committee, IV I. P. C. (Pre-Conference Publication).
S. C. Srivastava	...	Member, Organizing Committee, IV I. P. C. Member, Pre-Conference Publication Committee, IV I. P. C.
Anand-Prakash	...	Member, Organizing Committee, IV I. P. C. Incharge, Organization of IV I. P. C., Central India Excursion.
Pramod-Kumar	...	Member, Organizing Committee, IV I. P. C.
Chhaya Sharma	...	Member, Organizing Committee, IV I. P. C.
R. Y. Singh	...	Member, Organizing Committee, IV I. P. C.

X. DEPUTATION/TRAINING/STUDY ABROAD

M. N. Bose

Visited the following countries during 12 March to 31 March, 1976 :

ILE-IFE : To attend 7th African Micropalaeontological Colloquium (12th to 22nd March).

U. K. : Br. Mus. (Nat. Hist.) London. In London also visited Imperial College and Birbeck College. Went to Leeds and Banjor Universities (22 to 31 March, 1976).

G. K. B. Navale

To attend VIII International Congress on Carboniferous Stratigraphy and Geology and working Committee meetings of International Committee of Coal Petrology from September 5—13, Moscow, USSR. Afterwards visited the Geological Institute of USSR Academy of Sciences, Moscow and USSR Geological Survey Unit of Leningrad.

G. Rajagopalan

HIGH TETRAS (Czechoslovakia) to attend the 'International Conference on Lower Radioactivity Measurements and Applications' from 6 to 10 October, 1975. Afterwards visited the Radiocarbon and Tritium Dating Laboratories of the Department of Nuclear Physics, Cominus University, Bratislava.

BERLIN (WEST) (14 to 27 October) Was Guest Scientist in the Geochemistry Group of Hahn-Meitner Institute for Nuclear Research. Two reports were finalized on the Carbonates Geochemistry in collaboration with Dr P. Moller. Also visited Prof. Hermann and Dr Kohl of the Institute fur Ur-Und Fruhgeschichte in Berlin (East) and the Radiocarbon Dating Laboratory attached to the Institute. Was invited to visit the Radiocarbon and Tritium Dating Labs of the Nidersachsisches Landesamt fur Boden-forsching, Honnover and the Radiocarbon Dating Lab of Institut fur Reine and Angewandte Kernphysik, Kiel.

Thereafter spent two weeks in Britain as a guest of British Council visiting various Radiocarbon Dating Laboratories in England and Scotland.

At the invitation of Dr H. Loosli, he visited the Radiocarbon Lab of the Physics Institute, University of Bern, Switzerland and gave a lecture there on the Dating program of the Institute.

R. K. Kar

Attended the VII African Micropalaeontological Colloquium held at Ile-Ife, Nigeria during 16 to 21 March, 1976. Afterwards he went to U. K. and visited Cambridge, Bangor and Leeds under a visitorship programme offered by the British Council from 22 March to 3 April, 1976.

XI. HONOURS AND AWARDS

1. Dr M. N. Bose was Chairman, Palaeobotanical Section 7th African Micropalaeontological Colloquium, Ile-Ife (Nigeria). He was also one of advisers for the launching of an International Geological Correlation Programme Project on the biostratigraphy of the West and Central African sedimentary basins.

2. Shyam C. Srivastava has been awarded "Government of India Scholarship" for specialized training in Mesozoic Palaeobotany at the University of Texas, U. S. A. for 1975-76.

3. Miss Jayasri Banerji has been awarded the degree of Ph. D. from the University of Lucknow, Lucknow.

XII. FOUNDER'S DAY CELEBRATIONS

1. The Founder's Day was celebrated on 14th November, 1975 the birth day of Professor Birbal Sahni, F. R. S.

In the morning wreaths and flowers were placed on the Samadhi of Professor Birbal Sahni.

The evening function started at 4.00 p. m. His Excellency Dr M. Chenna Reddy, Governor of Uttar Pradesh was the Chief Guest at the well attended function.

Professor T. S. Sadasivan, Chairman, Governing Body welcomed the Chief Guest and other distinguished persons and guests.

At 4.45 p. m. Professor B. G. Deshpande, Head of the Geology Department, Poona University, Poona delivered the 5th Birbal Sahni Memorial Lecture entitled "Growth of ideas in oil exploration during the last 20 years."

Professor K. R. Surange, Director, Birbal Sahni Institute of Palaeobotany thanked the guests.

2. Dr D. P. Agarwal, Physical Research Laboratory, Ahmedabad delivered the 23rd Sir Albert Charles Seward Memorial Lecture entitled "Reconstructing the past climate and environment on 15th November, 1975 at 5.30 p. m.

3. Professor Reayat Khan, Head of the Botany Department, Aligarh Muslim University, Aligarh delivered the 5th Silver Jubilee Lecture entitled "Biology of Flower" on 16th November, 1975 at 5.30 p. m.

XIII. PUBLICATIONS

1. The Journal ... 'The Palaeobotanist'

(A) Volume 22, numbers 1 to 3 were published during the year.

(B) Volume 23, numbers 1 to 3 were sent to the Press. Page proofs of 23 (1) and galley proofs of 23 (2) were received from the Press. They were duly corrected and returned.

2. Seward Memorial Lecture

Twenty first Lecture "Polystely, primary xylem and the pteropsida" by Professor W. N. Stewart was published during the year.

3. Birbal Sahni Memorial Lecture

Third Lecture "The theory of Continental Drift in the light of recent researches" by Professor D. D. Pant was published.

The Fourth Lecture "Moulds, Mushrooms and Men" by Dr C. V. Subramanian was not received from the author and will be sent to Press on receipt.

The manuscript of fifth Lecture, "Growth of ideas in generation and migration of oil over last twenty years" by Professor B. G. Deshpande was sent to the Press during the year.

4. Silver Jubilee Lecture

Duly corrected page proofs of the Fourth Lecture "Fruits of exploration of moon and neighbouring planets" delivered by Professor D. Lal were returned to the Press. The Fifth Lecture "Biology of Flower" by Professor Reayat Khan was not received from the author and will be sent to Press on receipt.

5. Annual—Report

The Annual Report for the year 1974-75 was published and distributed.

6. Sale

During the year under review an income of Rs. 63,682.41 was registered from the sale proceeds of the

Institute's publications. The sum includes the following foreign exchange earned :

U. S. $	3,567.88
£	164.85

XIV. LIBRARY

1. Statement Showing the Details of Stock for the Year 1975-76

S. No.	DETAILS	POSITION ON 31-3-75	ADDED DURING 1975-76	TOTAL
1.	Books	2834	93	2927
2.	Issues of Journals	6070	135	6205
3.	Reprints	22256	440	22696
4.	Microfilms	214	3	217
5.	Theses	9	3	12
6.	Maps	24	7	31

2. Exchange-Programme

(i) Number of papers purchased for exchange 38

(ii) Total number of reprints sent out on exchange 2850

(iii) Number of individuals on exchange 314

(iv) Number of Institutions on exchange 62

(v) Sets of papers of Prof. Sahni's published work sent out. 8

3. Desire for setting up exchange relations with the library was expressed by various Institutions.

4. The total number of registered users of the library went up from 81 in 1974-75 to 89 this year. Besides, many research workers from different Universities and Institutions availed of lending and reference services.

5. Under Inter-Library-Loan programme, literature not available at the Institute's library was made available to members via loan from outside agencies.

6. The Library collaborated in compilation of "UNION CATALOGUE OF SCIENTIFIC JOURNALS, LUCKNOW REGION", a project sponsored by Indian National Scientific Documentation Centre, CSIR, New Delhi to provide information regarding availability of a scientific serial publication to all the persons engaged in research in this region.

7. Two members of Library staff, Mr. J. N. Nigam and Mr. S. N. Joshi, attended the tenth Annual Conference of "Indian Association of Special Libraries and Information Centres" held at CDRI, Lucknow as official delegates. The main topic for discussion was 'Aspects of procurement and utilization of journals' in a scientific library.

8. *Classification and cataloguing*—A new feature added this year was depth classification of books following Deway's Decimal Classification. At present the order of arrangement is author—alphabetical one. Quite a number of rare and out of print literature was reconditioned, covers in many reprints were replaced.

XV. MUSEUM

A. Exhibition Halls

1. *Geology Hall* (Hall No. 1)

All the show cases have been properly cleaned and polished. The reconstruction models have been repainted and retouched. The relief map of India has been repaired. Dull lables and legends of the show cases have been changed.

2. *Botany Hall* (Hall No. 2)

Still remains closed for the visitors.

B. Fossil Store Hall (Hall No. 3 Basement)

New collections have been stored in this Hall. More racks have been erected to accomodate more fossils.

C. Type and Figured Specimens/Slides etc.

The number of the type and figured specimens and slides kept in Prof. Sahni's room as on 31-3-1976 :

Type and figured specimens	...	1257
Type and figured slides	...	5028
Negatives of type and figured specimens and slides	...	3589

The checking of the type and figured specimens is nearly complete. The checking of type and figured slides has been started. Alongwith the type and figured specimens/slides, duplicates are being deposited by the workers. These duplicates are stored separately alongwith the details of the identification, locality and age etc. This would help the museum greatly in sending the duplicates quickly to various organizations.

D. New Collections

During the year collections have been made from about 72 localities of India by the Institute staff. The details are as follows :

Palaeozoic	...	115	specimens and samples
Mesozoic	...	299	,, ,,
Tertiary	...	563	,, ,,
Quaternary	...	209	samples
Oil Department	...	64	,,
Coal Department	...	101	,,

E. Presentation to Museum

Prof. H. P. Bank of Cornell University, Ithaca, U. S. A. has presented three slides of *Psilophyton dawsonii.*

F. Specimens received for Investigation

1. Palynological report on 11 samples received from the Director, Geological Survey of India, M. P. Circle, Shamla Road, Bhopal has been sent to him.

2. One sample from the Director, Himalayan Geology Division, G. S. I. Northern Division, Lucknow has been received for palynological studies.

3. One sample from Dy. Director General, Northern Division, Geological Survey of India, Lucknow has been received for palynological investigations.

G. Presentation of Duplicate Fossils

Representative plant fossils from different horizons of India have been presented to :

1. Dr S. K. Baksi, Department of Geological Sciences, Jadavpur University, Calcutta-32.
2. Shri R. N. Singh, Principal, U. P. Post Graduate College, Varanasi.
3. Prof. and Head of the Department of Botany, Saugar University, Saugar (M. P.).

4. Prof. Sandhu, Head, Dept. of Biology, Guru Nanak University, Amritsar (Punjab).

5. Dr V. H. Bedekar, Head, Dept. of Museology, Faculty of Fine Arts, M. S. University of Baroda Museum Building Sayaji Park, Baroda-5.

6. Rev. Principal, Carmel High School, Mahanagar, Lucknow.

7. Dr (Mrs) K. V. Marathe, Prof. & Head, Dept. of Botany, Institute of Sciences, Nagpur.

8. Dr C. P. Malik, Prof. & Head, Dept. of Botany, Punjab Agriculture University, Ludhiana.

9. Dr S. N. Singh, Prof. & Head, Dept. of Geology, Lucknow University, Lucknow.

10. Dr S. K. Goswami, Registrar, Meerut University, Meerut.

11. Head of the Department of Botany, M. S. College, Saharanpur.

12. Dr S. Acharya, Head, Dept. of Geology, Utkal University, Cuttack.

13. Dr Kartar Singh, Head, Dept. of Botany, Kirorimal College, University of Delhi, Delhi.

14. Dr B. Padhi, Prof. & Head, Dept. of Botany, Utkal University, Vani-Vihar, Bhuvenshwar.

H. Visitors During the Year

1. *Institutions*

(i) Botany Department, Burdwan University Burdwan (West Bengal).

(ii) Botany Department, Utkal University, Bhuvaneshwar, Orissa.

(iii) Dept. of Botany, Kerala University, Trivendrum.

(iv) Botany Dept., Poona University, Poona.

(v) Dept. of Biology, Kumaon University, Nainital.

(vi) Biology Dept., Mariampur Higher Secondary School, Kanpur.

(vii) Botany Dept., G. F. College, Shahjahanpur.

(viii) Botany Dept., Christ Church College, Kanpur.

(ix) Biology Dept., Guru Nanak University, Amritsar, Punjab.

(x) Botany Dept., Govt. Raza Post Graduate College, Rampur.

(xi) Botany Dept., St. Andrews College, Gorakhpur.

(xii) Botany Dept., Gauhati University, Assam.

(xiii) Geology Dept., Ranchi University, Ranchi Bihar.

(xiv) Botany Dept., P. G. T. D., Nagpur University, Nagpur.

(xv) Dr S. K. Das Gupta, Dr D. R. Das Gupta and Party, G. S. I., Calcutta.

(xvi) Dr D. G. Varadpande alongwith four Palaeobotany (Special) students, Dept., of Botany, Poona.

(xvii) Biology Dept., Marattwada University, Aurangabad.

2. *Individuals*

(i) Mr. A. K. Kapoor, Dept. of Science & Technology, Delhi.

(ii) Jamiko Miki, 3-30, Hiraisanso, Jakarazuka City, Japan.

(iii) S. Kokawa, Dept. of Biology, Faculty of Science, Japan.

(iv) Shri O. P. Sharma, Division of Biochemistry, C. D. R. I., Lucknow.

(v) Prof. L. P. Vidyarthi, Head, Dept. of Anthropology, Ranchi University, Ranchi (Bihar).

(vi) Mr M. S. Krishnaswamy, No. 20, XI-Block, Kenorapur, West Bangalore-20.

(vii) Prof. Yves Lemoigne, University de Lyon, France.

(viii) Mr. Sarat Chandra Mistra, Asstt. Engineer (PWD), Berhanpur University, Berhanpur.

(ix) Shri T. V. Shivarudrappa, Lecturer in Geology, Manasagangotri, Mysore.

(x) Dr. S. Jalan, Dept. of Botany, University of Rajasthan, Jaipur.

(xi) Prof. Heormann, Academic of Science, G. D. R., 108 Berlin.

(xii) Dr Gimllier Vohi, Academic of Science, Berlin, G. D. R. Radio Carbon Laboratory.

(xiii) Shri T. N. Bose, Director, Jail Industries, U. P., Lucknow.

(xiv) Shri S. S. Nandapurkar, Yuba Head Transport Corpn. Tulsa (OK), U. S. A.

(xv) Shri S. N. Ghosh, Director, Bureau of Petroleum and Chemical Studies, New Delhi.

(xvi) Mr. H. S. Lal, Dept. of Chemistry, Govt. Jubilee College, Lucknow.

1. Section Cutting Unit

All the machines of the section cutting unit have been repaired. A number of slides of petrified woods and rocks were prepared.

XVI. HERBARIUM

Herbarium Specimens

Addition of plant specimens during the year	73
Total number of plant specimens as on 31-3-76	9821

Fruit and Seed Specimens

Addition of fruits and seeds during the year	776
Total number of fruits and seeds as on 31-3-76	1747

Woods

Addition of wood samples during the year	166
Total number of wood samples as on 31-3-76	2762
Addition of wood slides during the year	121
Total number of wood slides as on 31-3-76	2183

Pollen Slides

Total number of pollen slides as on 31-3-76	8133

Other Slides

Total number of slides as on 31-3-76	4632

Phyllothek

Addition of leaf specimens during the year	56
Total number of leaf specimens as on 31-3-76	127

For matching and confirming the identification of the plant specimens collected during the preceding year two members of the herbarium went to Dehra Dun to consult herbarium of F. R. I. and B. S. I. (NC). The party collected 12 wood specimens alongwith herbarium from the adjoining forests of Dehra Dun. More stress was given to collect the plants of swamps near Golatappar Forest of Eastern Siwalik Division.

From the following organizations 166 wood specimens were received in exchange.

1. L. Clempoel van Lancker Pater Straat, TEMSE. Belgium ... 57 specimens

2. CTFT, Nogent, Sur Marne (Seine) France. ... 24 specimens

3. Musee Royal, de l' Afrique Central 31920 Tervuren, Belgium ... 85 specimens

A set of 30 Indian wood specimens was sent to L. Clempoel van Lancker, Belgium from the stock of wood specimens for exchange.

One hundred and twenty one wood slides were submitted by the Cenozoic Department which have properly been indexed, catalogued and incorporated.

A collection of 776 seed specimens from I. A. R. I., New Delhi submitted earlier by Quaternary Palynology Department has been catalogued and incorporated.

List of pollen slides available with us for exchange was prepared. The cyclostyled copies of the list were sent to various palynologists of the country and abroad for exchange of pollen/spores slides. Incharge, Palynology

Laboratory, N. B. G., Lucknow has sent us a set of 45 pollen slides of Gymnosperms on exchange. All the polleniferous materials present in the herbarium were listed. The list has been sent to the Quaternary palynology and Cenozoic palaeobotany departments for their use.

A set of 50 plant specimens from duplicate stock was sent to officer Incharge, Systematic Botany Branch, F. R. I., Dehra Dun on exchange.

Leaf specimens were received from the following herbaria for our newly developing section Phyllothek.

1.	Blatter Herbarium, St. Xavier's College, Bombay.	23
2.	BSI (NC), Dehra Dun.	11
3.	BSI (SC), Coimbatore.	10
4.	F. R. I., Dehra Dun.	12

The study on the foliar morphology of Hypericaceae and Clusiaceae (Guttiferae) has been taken up. Leaf clearing was done of several plants of the family Hypericaceae available in our herbarium.

Routine matching, identification, poisoning, labelling and repairing of herbarium specimens continued.

In connection with their research work following botanists consulted the harbarium.

1. Mr. Kusha Verma,
   Asstt. Botanist, Seed Technology Lab,
   IARI, New Delhi.

2. Prof. K. P. Deshpandey,
   Head of the Botany Department,
   Marathwada University,
   Aurangabad (Maharashtra).

3. Miss C. Lalitha,
Botany Department,
Lucknow University, Lucknow.

4. Mr. J. P. Misra, B. S. N. V. College,
Lucknow.

The herbarium curator took a fortnight training in "Modern Techniques of Chrysanthemums" organised by National Botanic Gardens, Lucknow.

XVII. BUILDING

To keep the Building in order, its general maintenance was carried out from time to time. Architects were requested to prepare estimates etc. for the construction of Laboratory rooms opposite the Lecture Hall on the Ist floor, Maceration Lab behind the Building and storage shed. These estimates got scrutinized from the U.P.P.W.D. and tenders have been invited. Works are to start in the next financial year.

XVIII. VISITORS

DISTINGUISHED PERSONS

Dr A. Ramachandran, F. N. A.,
Department of Science & Technology,
New Delhi.

His Excellency The Australian
High Commissioner in India,
New Delhi.

Jamiko Mika,
3-30 Hiraisanso Jakarazuka City,
Hyogo Pref. Japan.

Shri S. Kokawa,
Department of Biology, Faculty of Science,
Osaka City University,
Japan.

Prof. R. S. Sandhu,
Head, Department of Biology,
Guru Nanak University,
Amritsar.

Prof. L. P. Vidyarthi,
Head, Department of Anthropology,
Ranchi University,
Ranchi.

Shri M. S. Krishnaswamy,
No. 241, XI Block,
Bangalore-20.

Shri S. S. Nandapurkar Yuba,
Heat Transfer Corporation Tulsa (OK),
U. S. A.

Shri S. N. Ghosh,
Director,
Bureau of Petroleum & Chemical Studies,
New Delhi.

Hon'ble Shri K. D. Malaviya,
Minister for Petroleum,
New Delhi.

Hon'ble Shri Narain Dutt Tiwari,
Chief Minister of Uttar Pradesh,
Lucknow.

Dr. A. N. Joshi,
Director,
Indian Agricultural Research Institute,
New Delhi.

Dr Leon Stuchbie,
Polish Academy of Sciences

Dr Harald Walther
Botanist, G. D. R.

} C/o Botanical Survey of India, Calcutta.

Dr. B. C. Goswami,
Department of Botany,
Gauhati.

XIX. THE GOVERNING BODY, FINANCE AND BUILDING COMMITTEE AND SCIENTIFIC PROGRAMMING AND EVALUATION COMMITTEE

1. The Governing Body

CHAIRMAN

Professor T. S. Sadasivan, F. N. A.,
"Gokulam", 54, M. K. A. Koil St.,
Madras-600004.

MEMBERS

Mrs. Savitri Sahni,
686, Birbal Sahni Marg,
Lucknow.

Director,
Botanical Survey of India,
14, Madan Street,
Calcutta-13

Professor D. D. Pant, F. N. A.,
Head of the Botany Department,
University of Allahabad,
Allahabad.

Dr A. Ramachandran, F. N. A.,
Secretary to the Govt. of India,
Department of Science & Technology,
Technology Bhavan, New Mehrauli Road,
New Delhi-110029

Prof. B. G. Deshpande, F. N. A.,
Head of the Geology Department,
University of Poona,
Poona.

Dr D. Lal, F. N. A.,
Director,
Physical Research Laboratory, Navrangpura,
Ahmedabad-380009

Shri M. K. Venkataraman,
Deputy Financial Adviser,
Department of Science & Technology,
New Delhi-110029

Dr M. N. Deshpande,
Director-General,
Archaeological Survey of India,
Janpath, New Delhi-11.

Director-General,
Geological Survey of India,
27, Jawaharlal Nehru Road,
Calcutta-13.

Vice-Chancellor,
University of Lucknow,
Lucknow.

Professor B. S. Trivedi,
Department of Botany,
University of Lucknow,
Lucknow.

Professor S. D. Saxena,
Vigyan Kutir, Civil Lines,
Rewa (M. P.).

Professor K. R. Surange, F. N. A.,
Director,
Birbal Sahni Institute of Palaeobotany,
Lucknow (Member-Secretary).

Shri Gurcharan Singh,
Registrar,
Birbal Sahni Institute of Palaeobotany,
Lucknow (Non-member Asstt. Secretary).

Finance and Building Committee

CHAIRMAN

Professor T. S. Sadasivan, F. N. A.,
"Gokulam", M. K. A. Koil St.,
Madras-600004

MEMBERS

Prof. D. D. Pant, F. N. A.,
Head of the Botany Department,
University of Allahabad,
Allahabad.

Shri M. P. M. Kutty,
Under Secretary to the Govt. of India,
Department of Science & Technology,
New Delhi-110029

Shri M. K. Venkataraman,
Deputy Financial Adviser,
Department of Science & Technology,
New Delhi-110029

Shri S. C. Das,
Superintending Engineer,
39 Circle, P. W. D., Gulistan Colony,
Lucknow.

Shri Naresh Kochar,
Kochar & Associate,
16, Vidhan Sabha Marg,
Lucknow.

Professor K. R. Surange, F. N. A.,
Director,
Birbal Sahni Institute of Palaeobotany,
Lucknow.

3. **Scientific Programming and Evaluation Committee**

CHAIRMAN

Professor K. R. Surange, F. N. A.,
Director,
Birbal Sahni Institute of Palaeobotany,
Lucknow.

MEMBERS

Professor D. D. Pant, F. N. A.,
Head of the Botany Department,
University of Allahabad,
Allahabad.

Professor B. G. Deshpande, F. N. A.,
Head of the Geology Department,

University of Poona,
Poona.

Professor Rama,
Tata Institute of Fundamental Research,
Bombay.

Professor B. S. Trivedi,
Department of Botany,
University of Lucknow,
Lucknow.

Dr R. N. Lakhanpal,
Deputy Director,
Birbal Sahni Institute of Palaeobotany,
Lucknow.

Dr D. C. Bharadwaj,
Head, Coal Palaeobotany Department,
Birbal Sahni Institute of Palaeobotany,
Lucknow.

Dr M. N. Bose,
Head, Mesozoic Palaeobotany Department,
Birbal Sahni Institute of Palaeobotany,
Lucknow.

Dr Vishnu-Mittre
Head, Quaternary Palynology Department,
Birbal Sahni Institute of Palaeobotany,
Lucknow.

Dr S. C. D. Sah (upto 31-1-1976)
Head, Oil Palynology Department,
Birbal Sahni Institute of Palaeobotany,
Lucknow.

Dr Uttam Prakash (from 1-1-1976)
Head, Cenozoic Palaeobotany Department,
Birbal Sahni Institute of Palaeobotany,
Lucknow.

Dr K. M. Lele (from 1-1-1976)
Head, Palaeozoic Palaeobotany Department,
Birbal Sahni Institute of Palaeobotany,
Lucknow.

Dr G. Rajagopalan,
Head, Carbon Dating Laboratory,
Birbal Sahni Institute of Palaeobotany,
Lucknow.

XX. THE STAFF

DIRECTOR

Professor K. R. Surange, M. Sc., Ph. D. (Lucknow), Ph. D. (Cantab), F. Pb. S., F. N. A., F. A. Sc.

DEPUTY DIRECTOR

Dr R. N. Lakhanpal, M. Sc., Ph D., F. Pb. S, F. B. S., F. N. A. Sc.

DEPARTMENT OF PALAEOZOIC PALAEOBOTANY

Dr K. M. Lele, M. Sc., Ph. D.
Dr P. K. Maithy, M. Sc., Ph. D.
Dr (Mrs.) Shaila Chandra, M. Sc., Ph. D., F. L. S.
Shri A. K. Srivastava, M. Sc.
Shri Manoj Shukla, M. Sc.
Shri J. P. Mandal, M. Sc.
Miss Reshma Bijlani, M. Sc. (Research Scholar till 21-11-75)

DEPARTMENT OF MESOZOIC PALAEOBOTANY

Dr M. N. Bose, M. Sc., Ph. D., F. Pb. S., Head
Correspondent de l'arsom
Dr Sukh-Dev, M. Sc. (Hons), Ph. D. (Lucknow),
Ph. D. (Reading)
Dr H. K. Maheshwari, M. Sc., Ph. D.
Dr Shyam C. Srivastava, M. Sc., Ph. D.
Miss Jayasri Banerji, M. Sc., Ph. D.
Shri K. P. Navneetha Kumaran, M. Sc.
Miss Zeba Bano, M. Sc.
Shri B. N. Jana, M. Sc. (Research Scholar)

DEPARTMENT OF CENOZOIC PALAEOBOTANY

Dr U. Prakash, M. Sc., Ph. D.
Dr N. Awasthi, M. Sc., Ph. D.
Dr M. B. Bande, M. Sc., Ph. D.
Dr K. Ambwani, M. Sc., Ph. D.
Shri Jaswant Singh Guleria, M. Sc.

DEPARTMENT OF COAL PALAEOBOTANY

Dr D. C. Bharadwaj, M. Sc., Ph. D. Head
(Lucknow), Dr rer. Nat. (Bonn), F. B. S., F. Pb. S.
Dr G. K. B. Navale, M. Sc., Ph. D., F. G. S.,
B. G. M. S.
Dr R. S. Tiwari, M. Sc., Ph. D.
Dr Suresh C. Srivastava, M. Sc., Ph. D.
Dr Pramod Kumar, M. Sc., Ph. D.
Shri S. K. Kulshrestha, M. Sc.
Shri B. K. Misra, M. Sc.
Miss Archana Dwivedi, M. Sc
Miss Vijaya Rana, M. Sc.

DEPARTMENT OF QUATERNARY PALYNOLOGY

Dr Vishnu-Mittre, M. Sc., Ph. D. (Lucknow), Head
Ph. D. (Cantab).
Dr H. P. Gupta, M. Sc., Ph. D.
Dr Anand-Prakash, M. Sc., Ph. D.
Dr (Mrs.) Chhaya Sharma, M. Sc., Ph. D.
Dr (Mrs.) Asha Khandelwal, M. Sc., Ph. D.
Miss R. Savithri, M. Sc.
Shri A. K. Saxena, M. Sc.
Shri Kamla Prasad, M. Sc.

DEPARTMENT OF OIL PALYNOLOGY

Dr S. C. D. Sah, M. Sc., Ph. D. (On foreign service terms to Wadia Institute of Himalayan Geology, Dehra Dun as Director, w. e. f. 1-2-1976).

Dr Haripal Singh, M. Sc., Ph. D.
Dr K. P. Jain, M. Sc., Ph. D.
Dr R. K. Kar, M. Sc., Ph. D.
Dr R. Y. Singh, M. Sc., Ph. D.
Shri R. K. Saxena, M. Sc.
Shri A. K. Khanna, M. Sc.
Shri S. K. M. Tripathi, M. Sc.
Shri Rahul Garg, M. Sc.

GEOLOGY SECTION

Shri N. C. Mehrotra, M. Sc.

C-14 LABORATORY

Dr G. Rajagopalan Head
Shri Govind Jain
Dr Raghubir Singh, M. Sc., Ph. D., w. e. f. 16-1-76

PUBLICATION

Shri N. N. Moitra, B. A. (Retired on 31-7-75)
Shri Jaswant Singh, M. Sc.

LIBRARY

Shri J. N. Nigam, B. A., B. Lib. Sc.
Shri S. N. Joshi, B. Sc., B. Lib. Sc.

MUSEUM

Dr Anil Chandra, M. Sc., Ph. D. (Curator)
Shri N. C. Saxena, B. A , (Museum Assistant)
Shri J. C. Srivastava, M. Sc. (Offg. Junior Museum Assistant)

HERBARIUM

Dr H. A. Khan, M. Sc., Ph. D. (Curator)
Shri G. P. Srivastava, M. Sc. (Herbarium Incharge)
Shri Diwakar Pradhan, B. Sc. (Herbarium Assistant)
Shri A. K. Singh Rathore, B. Sc. (Herbarium Assistant)

LABORATORY SERVICES

Shri H. N. Boral, B. Sc. (S. T. A., w. e. f. 27-10-75)
Miss Asha Bharadwaj, B Sc. (J. T. A.)
Miss Madhabi Chowdhury, B. Sc. (J.T. A)
Miss Indra Kumari, B. Sc. ,,
Shri D. C. Joshi, B. Sc. ,,
Shri B. Sekar, B. Sc. ,,
Miss Kamla Amarlal, B. Sc. ,,
Shri N. K. Khasnavis, B. Sc.
Miss Sona Rani, B. Sc. (Scheme "Palynological studies from Oil India Ltd.")

Shri Vijay Singh Panwar (Glass Blower)
Shri P. S. Salujha, Mechanic (w. e. f. 9-10-1975)

PHOTOGRAPHY AND DRAWING

Shri S. S. Rana (Artist)
Shri P. C. Roy (Photographer)

STORES

Shri I. J. Mehra, B. A. (Store-keeper)

ACCOUNTS

Shri Ghanshyam Singh, B. Com. (Accounts Officer)
Shri S B. Verma, M. A., B. Com., D. P. A. (Accountant)

Shri T. N. Shukla, B. A. (U. D. C.)
Shri B. K. Jain, B. A. (U. D. C.)
Shri N. N. Joshi (L. D. C)
Shri R. K. Takru, B. A. (L. D. C.)

ADMINISTRATION

Shri Gurcharan Singh, M. A. (Registrar)
Shri V. P. Gulati (Deputy Registrar)
Shri S. D. Mehtani (Office Assistant)
Shri S. K. Suri (Stenographer)
Shri S. P. Chadha, B. A. (P. A. to Director)
Mrs. P. K. Srivastava (Receptionist)
Shri H. S. Srivastava, B. Com. (U. D. C.)
Shri Bhagwan Singh (U. D. C.)
Shri I. J. S. Bedi (Steno-typist)
Shri Ramesh Chandra (L. D. C.)
Shri R. K. Kapoor (Typist)
Shri K. Devrajan (Typist)
Shri J. L. Sharma (Typist, w. e. f. 12-1-76)

BALANCE SHEET AS

LIABILITIES	Rs.	Rs.
Capital Funds		
As per 31 March, 1975	28,82, 985.52	
Govt. of India Grants on Capital Account during the year	4,08,650.00	
Recurring Grant used for Capital formation for last year	75.00	
Recurring Grant used for Capital formation : Books & Journals; Maps & Toposheets	22,923.95	
	33,14,634.47	
Less Refunds out of Capital Grants	60.57	33,14,573.90
Add Excess of Revenue grants over Revenue Expenditure		2,41,124.25
Add Funds provided by other organisations for Capital formation		
M. G. T. Scheme (C. S. I. R.)	8,100.79	
Coal Scheme ,,	7,784.66	
Palynology Scheme ,,	5,207.87	
Rajasthan Scheme (Sponsored by Univ. of Wisconsin)	58,913.25	80,006.57
	Total C/o	36,35,704.72

PALAEOBOTANY, LUCKNOW

ON 31 MARCH, 1976

ASSETS	Rs.	Rs.
Land Donated by U. P. Government		32,292.00
Works and Buildings		
As per 31st March 1975	11,09,645.34	
During the year	5,012.30	11,14,657.64
Apparatus & Equipments		
(A) **Research Apparatus & Equipments**		
As per 31st March, 1975	5,96,950.83	
During the year	1,37,558.77	7,34,509.60
(B) **Workshop Equipments**		
As per 31st March, 1975	62,213.95	62,213.95
(C) **Office & Miscellaneous Equipment**		
As per 31st March, 1975	46,278.37	
During the year	16,083.45	62,361.82
(D) **Plant & Machinery**		
As per 31st March, 1975	85,471.40	
During the year	—	85,471.40
(E) **Establishment of C-14 Lab**		
As per 31st March, 1975	3,17,234.14	
During the year	1,82,188.43	4,99,422.57
	Total C/o	25,90,928.98

LIABILITIES	Rs.	Rs.
	Total B/F	36,35,704.72
Cost of Land Donated by U. P. Government		32,292.00
UNESCO Aid Fund		19,629.75
Value of Gift in Kind-Humboldt Foundation W. Germany		75,000.00
General Provident Fund		10,01,709.04
Donation Accounts		
C. D. P. Memorial Fund	1,626.88	
C. L. K. Memorial Fund	2,202.75	
P. C. B. Memorial Fund	1,966.25	
A. C. Seward Memorial Fund	6,724.00	
P. K. Srivastava Memorial Fund	2,420.00	
Other Donations	7,262.65	
Dorothy Walton	352.70	22,555.23
Founders Donation Account		1,52,500.00
Burmah Oil Company		1,900.00
Deposits Accounts		14,791.78
Value of Priced Publications:		
As per contra		3,23,184.60
Loans and Advances:		
As per contra		40,538.00
	Total C/o	53,19,805.12

ASSETS	Rs.	Rs.
	Total B/F	25,90,928.98
Apparatus & Equipments (Donated) :		
M. G. T. Seheme	7,155.79	
Burmah Oil Company	700.00	
Founders Donation	2,500.00	
Coal Scheme	6,645.29	
Palynology Seheme	5,207.87	
Rajasthan Scheme	21,138.90	43,347.85
UNESCO Aid Equipment Humboldt Foundation W. Germany		
(Gift of Microscope)		75,091.50
Vehicles		56,433.65
Furnitures and Fixtures		
As per 31st March, 1975	3,41,056.57	
During the year	41,796.25	3,82,852.82
Furnitures and Fixtures (Donated) :		
Burmah Oil Company	1,200.00	
M. G. T. Scheme	945.00	
Coal Scheme	1,139.37	
Rajasthan Scheme	979.70	4,264.07
Books and Journals		
As per 31st March, 1975	58,910.07	
During the year	31,699.52	
Founders Library Donated	50,000.00	1,40,609.59
	Total C/o	33,13,158.21

LIABILITIES	Rs.		Rs.
	Total	B/F	53,19,805.12
	Total	C/o	53,19,805.12

ASSETS	Rs.	Rs.
	Total B/F	33,13,158.21
Maps and Toposheets		
As per 31st March, 1975	6,550.91	
During the year	191.10	6,742.01
Founders Fossils Collections (Donations)		50,000.00
Donation Account :		
Investments		17,500.00
General Provident Fund		
Investments	5,16,560.93	
Advance out of G. P. F.	62,425.00	
Insurance Policies subscribed out of G. P. F. to extent of	35,342.00	6,14,327.93
Priced Publications in Stock		
"The Palaeobotanist" Volume 1-21	1,51,357.10	
Symposium	67,485.00	
Autumn School Proceedings	36,000.00	
Monograph	43,300.00	
Seward Memorial Lectures	21,943.00	
Birbal Sahni Memorial Lecture	1,598.00	
Silver Jubilee Lecture	1,490.00	3,23,173.10
Picture Post Cards		11.50
Loans and Advances		
Festival Advance	2,960.00	
Conveyance Advance :	37,578.00	40,538.00
	Total C/o	43,65,450.75

LIABILITIES	Rs.	Rs.
	Total B/F	53,19,805.12
	Grand Total	53,19,805.12

Sd/- Ghanshyam Singh
Accounts Officer
Birbal Sahni Institute of Palaeobotany

Sd/- Gurcharan Singh
Registrar
Birbal Sahni Institute of Palaeobotany

ASSETS	Rs.	Rs.
	Total B/F	43,65,450.75
Sundry Debtors :		
For unsettled advances (C/R) Account	32,764.25	
For unsettled advances (C. N. R.) Account as on 31-3-1975	62,968.23	95,732.48
UNESCO Book Coupons		982.94
Cash Balance :		
At Bank		
Current Account at S. B. I., Lucknow		4,70,224.41
Savings Bank Account at S. B. I., Lucknow		3,87,381.11
In Hand		
Cash in hand (C. R.) Account		17.27
Cash in hand (Oil India Scheme)		16.16
	Grand Total	53,19,805.12

Sd/- Y. B. Singh	Sd/- G. D. Agarwal	Sd/- K. R. Surange
Section Officer	*Zonal Audit Officer,*	*Director*
A. G. U. P. I.	Lucknow Zone,	Birbal Sahni Institute
Allahabad	Lucknow	of Palaeobotany

BIRBAL SAHNI INSTITUTE OF

INCOME & EXPENDITURE ACCOUNT FOR THE

EXPENDITURE	PLAN	NON-PLAN	TOTAL
Academic Expenses			
To Pay & Allowances of Academic Staff	1,16,255.48	6,25,472.54	7,41,728.02
To Field Excursion	14,062.68	1,971.27	16,033.95
To Refresher Course Expenses			
To honorarium to Lectures			
(i) Birbal Sahni Memorial Lecture		350.00	350.00
(ii) Silver Jubilee Memorial Lecture		350.00	350.00
To Training of Academic Staff		2,576.00	2,576.00
To International Programmes Deputations Abroad		26,987.70	26,987.70
To Series of Extension Lectures			
To Honorarium Foreign Visiting Scientist			
To presentation of Medals			
To Expense on IV I.P.C.	8,672.15		8,672.15
		Total C/o Rs.	7,96,697.82

PALAEOBOTANY, LUCKNOW

YEAR ENDING 31st MARCH, 1976

INCOME	PLAN	NON-PLAN	TOTAL
Balance of Last Year's Grant of Revenue A/c Allowed for Expenditure During Current Year, Silver Jubilee and Oil India Grant Account	22,991.38	27,720.45	50,711.83
By Grants from Govt. of India on Revenue Account	2,87,500.00	17,41,264.00	20,28,764.00
By Grants from Govt. of India for Silver Jubilee			
By Grants from U. P. Govt. on Revenue Account		5,000.00	5,000.00
By Grants from Govt. of India for Research Scholarship			
By Grants from Other Organisations			
(i) Oil India Ltd.,		10,000.00	10,000.00
(ii) Subventions from Universities and U.G.C. for Silver Jubilee Celebrations			
		Total C/o Rs.	20,94,475.83

EXPENDITURE	PLAN	NON-PLAN	TOTAL
	Total B/F Rs.		7,96,697.82
Expenses on Services Ancillary to Research			
To pay & Allowances of Auxiliary Tech. Staff	7,084.15	2,28,088.19	2,35,172.34
To Chemical & Glasswares, Photogoods & Small Apparatus etc.	34,280.47	15,872.45	50,152.92
To Library Equipments		21,464.06	21,464.06
To Herbarium Requirements	421.38	749.11	1,170.49
To Museum Requirements	86.18	2,694.11	2,780.29
To Maintenance of Equip., Appa. & Workshop Machinery	5,692.25		5,692.25
To Publication Expenses			
"The Palaeobotanist"		31,624.12	31,624.12
Symposium	—	—	—
Monograph	—	—	—
Birbal Sahni Memorial Lecture	—	823.92	823.92
Silver Jubilee Lecture	—	1,221.76	1,221.76
Annual Report	—	1,908.93	1,908.93
Seward Memorial Lecture	—	1,201.18	1,201.18
	Total C/o Rs.		11,49,910.08

INCOME	PLAN	NON-PLAN	TOTAL
	Total B/F Rs.		20,94.475.83
By Sale Proceeds of Publications			
(i) The Palaeobotanist		47,519.79	47,519.79
(ii) Monographs		309.65	309.65
(iii) Symposium and Special Publications		15,078.77	15,078.77
(iv) Seward Memorial Lecture		417.00	417.00
(v) Birbal Sahni Memorial Lecture		129.60	129.60
(vi) Silver Jubilee Memorial Lecture		227.60	227.60
(vii) Picture Post Cards		129.50	129.50
By Miscellaneous Receipts and Recoveries			
(i) Vehicle Charges		211.28	211.28
(ii) By Telephone Charges		1,174.27	1,174.27
(iii) By Visting Scientist Room Charges		85.00	85.00
(iv) By Application Fee		2,433.00	2,433.00
Miscellaneous Receipt and Recoveries	116.95	3,178.98	3,295 93
	Total C/o Rs.		21,65,487 22

EXPENDITURE	PLAN	NON-PLAN	TOTAL
	Total B/F Rs.		11,49,910.08
To Travelling and other Allowances			
For Governing Body, Scientific Programmes, and Evolution Committee and Selection Committee meeting	5,711.77	4,284.45	9,996.22
For attending Scientific meetings and Conferences in India and for other purposes	2,522.17	8,870.70	11,392.87
For Reimbursement of Medical Expenses	99.59	22,869.37	22,968.96
For Overtime Allowances	—	2,140.85	2,140.85
To Leave Travel Concession	—	2,202.88	2,202.88
To Honorarium to Secretary to Chairman	—	—	—
To Reimbursement of Tuition Fees	—	299.50	299.50
To Children Education Allowance	—	626.25	626.25
To Pensionary Expenses			
To Supernuation Allowance and Pension		21,650.90	21,650.90
Total C/o Rs.	1,94,888.27	10,26,300.24	12,21,188.51

INCOME	PLAN	NON-PLAN	TOTAL
	Total B/F Rs.		21,65,487.22
Recoveries of Flood Advance			
Recoveries of Conveyance Advance		6,846.00	6,846.00
Recoveries of Festival Advance		4,520.00	4,520.00
Receipts from Contractors		—	—
Interest on Advances		107.50	107.50
Total C/o Rs.	3,10,608.33	18,66,352.39	21,76,960.72

EXPENDITURE	PLAN	NON-PLAN	TOTAL
Total B/F	1,94,888.27	10,26,300.24	12,21,188.51
To General Expenses			
To Pay and Allowance of Administrative Staff	294.36	3,05,467.29	3,05,761.65
To Telephone and Trunk call charges	—	9,688.75	9,688.75
To Postage		10,105.75	10,105.75
To Advertisement Charges	14,435.26	4,177.37	18,612.63
To Hot and Cold Weather Charges	—	2,278.50	2,278.50
To Petrol and Mobil Oil	3,495.14	1,894.52	5,389.66
To Electricity Charges	20,581.02	8,737.45	29,318.47
To Municipal Taxes	—	5,027.16	5,027.16
To Insurance of Vehicle and Library	—	1,067.25	1,067.25
To Uniform to Class IV Staff	1,853.06	3,187.15	5,040.21
To Printing and Stationary	7,730.63	12,048.53	19,779.16
To Custom Duty and Post Trust Charges	—	52.10	52.10
Total B/F	Rs. 2,43,277.74	3,90,032.06	16,33,309.80

INCOME	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	3,10,608.33	18,66,352.39	21,76,960.72
Total C/o Rs.	3,10.608 33	18,66,35239	21,76,960.72

EXPENDITURE	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	2,43,277.74	13,90,032.06	16,33,309.80
To Railway Ft. and Carriage	—	961.08	961.08
To Entertainment Allowance to Director	—	1,695.49	1,695.49
To Miscellaneous and Unforeseen	8,863.78	10,211.59	19,075.37
To Leave Salary	—	—	—
To Maintenance Expenses			
To Building	—	3,152.15	3,152.15
To Garden	—	2,193.53	2,193.53
To Vehicle	3,149.92	2,053.03	5,202.95
To Repairs and Renewals	—	5,735.41	5,735.41
To Petty Constructions	—	728.66	728.66
To Other Expenses			
To Contribution to Provident Fund	—	—	—
To Legal Advice	—	—	—
To Medical Advice	—	130.50	130.50
To Festival Advance	—	4,400.00	4,400,00
To Conveyance	—	20,000.00	20,000.00
To Oil India Expenses			
To Pay and Allowance	—	7,127.39	7,129.39
To T. A. Expenses	—	—	—
To Contingencies	—	1,225.45	1,225.45
Total C/o Rs.	2,55,291.44	14,49,646.34	17,04,937.78

INCOME	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	3,10,608.33	18,66,352.39	21,76,960.72
Total Rs.	3,10,608 33	18,66,352.39	21,76,960.72

Sd/-Y. B. Singh
Section Officer
A. G. U. P. I. Allahabad

Sd/-G. D. Agarwal
Zonal Audit Officer
Lucknow Zone, Lucknow

EXPENDITURE	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	2,55,291.44	14,49,646.34	17,04,937.78
To Silver Jubilee Expenses			
To Silver Jubilee Publications	—	—	—
To Govt. of India Scholarship Expenses	—	16,851.61	16,851.61
To Last Years Excess Expenditure	—	—	—
Central Recurring Grant Account	—	2,14,047.08	2,14,047.08
Govt. of India Res. Scholarship Grant Account	—	—	—
	2,55,291.44	16,80,545.03	19,35,836.47
To Expenditure on Transfer to C. N. R. Account to Expenditure on Miscellaneous Receipts			
EXCESS OF INCOME OVER EXPENDITURE	55,316.89	1,85,807.36	2,41,124.25
Grand Total	3,10,608.33	18,66.352 39	21,76,960.72

Sd/-Ghanshyam Singh
Accounts Officer
Birbal Sahni Institute
of Palaeobotany

Sd/-Gurcharan Singh
Registrar
B. S. I. P.,
Lucknow

Sd/-K. R. Surange
Director
Birbal Sahni Institute
of Palaeobotany

BIRBAL SAHNI INSTITUTE OF

RECEIPT & PAYMENT ACCOUNT FOR

RECEIPTS	PLAN	NON-PLAN	TOTAL
To Opening Balance			
Bank Account (Misc.)	3,13,675.66		3,13,675.66
Cash Account	—	108.21	108.21
Oil India Account			
Bank Account	—	7,960.62	7,960.62
Cash Account	—	16.16	16.16
Donation Account			
Bank Account	—	5,285.23	5,285.23
Silver Jubilee Account			
Bank Account	—	19,635.46	19,635.46
Amount spent out of balance now recouped	24,066.77	—	24,066.77
Refund of Excursion Advance	—	—	—
Proceeds of cancelled cheque	10.00	—	10.00
To Govt. of India Grants (Cap. A/c)	4,08,650.00	—	4,08,650.00
To Govt. of India Grants (Rev. A/c)	2,87,500.00	17,41,264.00	20,28,764.00
To Govt. of India Grants (S. J. A/c)	—	—	—
To Govt. of India Res. — Scholarship Grant	—	—	—
To Govt. of U. P. Research Grant	—	5,000.00	5,000.00
Total C/o Rs.			28,13,172.11

PALAEOBOTANY, LUCKNOW.

THE PERIOD 1.4.1975 to 31.3.76

PAYMENTS	PLAN	NON-PLAN	TOTAL
Capital Account			
By Opening Balance	—	2,14,047.08	2,14,047.08
By Works & Building	5,012.30	—	5,012.30
By Research Apparatus & Equipments			
By Research Apparatus and Equipment	1,37,558.77	—	1,37,558.77
By Equipment for services Ancillary to Research—			
Photography Section	1,849.90	—	1,849.90
Library	2,659.65	—	2,659.65
Museum	1,374.92	—	1,374.92
Herbarium	—	—	—
Workshop Maceration Auditorium and Lab.			
Stores	1,773.07	—	1,773.07
Visiting Scientist Room	—	—	—
Garden Equipment	—	—	—
Office & Misc. Equipment	5,280.26	—	5,280.26
C-14 Laboratory	2,29,989.60	—	2,29,989.60
Books & Periodicals for Lib.	36,922.98	—	36,922.98
By Furniture & Fixtures	53,336.42	—	53,336.42
By Vehicles	—	—	—
Total C/o Rs.			6,89,804.95

RECEIPTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.			28,13,172.11
To Grant from other organisations	—	—	—
Silver Jubilee	—	—	—
Oil India	—	10,000.00	10,000.00
To Sale Proceeds of Publications			
The Palaeobotanist	—	47,519.79	47,519.79
Monograph	—	309.65	309.65
Symposium	—	15,078.77	15,078.77
Seward Memorial Lecture	—	417.00	417.00
Birbal Sahni Memorial Lecture	—	129.60	129.60
Silver Jubilee Memorial Lecture	—	227.60	227.60
Picture Post Cards	—	129.50	129.50
To Administrative Receipts			
Refund of Additional Wages from R. P. F. Commissioner, Kanpur	—	2,807.43	2,807.43
Income-Tax	4,483.00	22,229.00	26,712.00
Insurance Premium (S. S. Scheme)	4,993.47	35,075.89	40,069.36
C. T. D. (Post Office)	110.00	3,970.00	4,080.00
Vehicle Charges	—	211.28	211.28
Telephone Charges	—	1,174.27	1,174.27
V. S. Room Charges	—	85.00	85.00
Total C/o Rs.			29,62,123.36

PAYMENTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.			6,89,804 95
By Refund of Grants To Govt.			
Capital Grants	60.57	—	60.57
Revenue Grants	—	—	—
Silver Jubilee Grants	—	—	—
Revenue Account By			
Pay and Allowances :			
Pay (Academic)	87,010.22	4,43,401.69	5,30,411.91
Pay (Auxillary Technical)	4,455.32	1,40,246.62	1,44,701.74
Pay (Administrative)	168.97	1,85,997.43	1,86,166.40
Leave Salary	—	—	—
Dearness Pay	—	—	—
Dearness Allowance	23,264.30	2,78.915.86	3,02,180.16
House Rent Allowance	5,434.62	79,335.48	84,770.10
City Compensatory Allowance	3,300.56	31,131.14	34,431.70
Interim Relief	—	—	—
Children Education	—	626.25	626.25
Overtime Allowance	—	2,140.85	2,140.85
Reimbursement of Medical Expenses	99.59	23,319.37	23,418.96
Reimbursement of Tuition fees	—	299.50	299.50
Leave Travel Concession	—	3,086.88	3,086.88
Total C/o Rs.			20,02,099.97

RECEIPTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.			29,62,123.36
Recovery of Adv. and Int. under G. P. F.	5,161.00	50,101.00	55,262.00
G. P. F. Subscription	7,791 00	84,456.00	92,247.00
Additional D.A., G.P.F. Suspense A/c.	144.00	29,262.30	29,406.30
C.D.S. (Additional D.A.)	7,316.00	89,899.00	97,215.00
Miscellaneous Receipts & Re overy	116.95	3,178.98	3,295.93
C.D.S. (Wages Account)	—	18,380.00	18,380.00
Application fee	—	2,433.00	2,433.00
Advance	—	—	—
To Loans and Advances			
Receveries of Flood Rel. Advance	—	—	—
Receovery of Festival Advance	—	4,520.00	4,520.00
Recevery of Conveyance Advance	—	6,846.00	6,846.00
Interest of Conveyance Advance	—	107.50	107.50
To Deposits			
Security Deposits	9,250.00	—	9,250.00
By transfer to Building Advance	—	—	—
Miscellaneous Deposits	—	—	—
Total C/o Rs.			32,81,086.09

PAYMENTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.			20,02,099.97
Hon. to Secty. to Chairman	—	—	—
By Travelling Allowance			
For Governing Body & Selection Committee Meeting	5,711.77	4,284.45	9,996.22
For attending meetings & Conference in Indian & for other purposes	2,747.17	10,515.70	13,262.87
By Maintenance of Property			
For building	—	3,152.15	3,152.15
For Garden	—	2,193.93	2,193.53
For Equipment & Apparatus	5,692.25	—	5,692.25
For Vehicles	3,149.92	2,053.03	5.202.95
For Repairs & Renewals	—	5,735.41	5,735.41
For petty Constructions	—	728.66	728.66
By Contingencies			
For Telephone & Trunk Call Charges	—	9,688.75	9,688.75
For postage	—	10,105.75	10,105.75
For Advertisement	14,435.26	4,177.37	18,612.63
For Hot & Cold Weather Charges	—	2,278 50	2,278.50
Total C/o Rs.			20,88,749.64

RECEIPTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.			32,81,086.09
Donations and Endowments			
Donation	—	—	—
Proceeds of Mature Securities	—	—	—
Interest	—	120.00	120.00
Total C/o	10,73,267.85	22,07,938.24	32,81,206.09

PAYMENTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.			20,88,749.64
For Petrol & Mobil Oil	3,495.14	2,294 52	5,789.66
For Electricity Charges	20,581.02	8,737.45	29,318.47
For Municipal Taxes	—	5,027.16	5,027.16
For Insu. of Vehicles & Lab.	—	1,067.25	1,067.25
For Liveries to Subordinate Staff	1,853.06	3,187.15	5,040.21
For Printing & Stationery	7,730.63	12,048.53	19,779.16
For Custom Duty & Port Trust Ch.	—	152.10	152.10
For Railway Ft. & Carriage	—	1,061.08	1,061.08
For Entertainment All. Director	—	1,695.49	1,695.49
For Miscellaneous & Unforeseen	8,863.78	10,211.59	19,075.37
For Glassware & Chemical etc,	34,280.47	15,872.45	50,152.92
For Library Requirements	—	21,469.06	21,469.06
For Museum Requirements	86.18	2,694.11	2,780.29
For Herbarium Requirements	421.38	1,614.11	2,035.49
Total C/o Rs.			22,53,193.35

RECEIPTS	PLAN	NON-PLAN	TOTAL
Total B/F	10,73,267.85	22,07,938.24	32,81,206.09
Total C/o	10,73,267.85	22,07,938.24	32,81,206.09

PAYMENTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.			22,53,193.35
For Legal Advice	—	1,104.75	1,104.75
For Medical Advice	—	130.50	130.50
By Publications			
For the Palaeobotanist	—	31,624.12	31,624.12
For Symposium	—	—	—
For Monograph	—	—	—
For Seward Memorial Lecture	—	1,201.18	1,201.18
For Annual Report	—	1,908.93	1,908.93
For Birbal Sahni Memorial Lecture	—	823.92	823.92
For Silver Jubilee Memorial Lecture	—	1,221.76	1,221.76
By Academic Expenses			
For field Excursion	35,953.18	1,971.27	37,924.45
For Refresher Course Expenses	—	—	—
For Honorarium to Lectures	—	—	—
Birbal Sahni Memorial Lecture	—	350.00	350.00
Silver Jubilee Memorial Lecture	—	350.00	350.00
Sir A C. Seward Memorial Lecture out of Donation Account	—	350.00	350.00
Total C/o Rs.			23,30,182.96

RECEIPTS	PLAN	NON-PLAN	TOTAL
Total B/F	10,73,267.85	22,07,938.24	32,81,206.09
Total C/o	10,73,267.85	22,07,938.24	32,81,206.09

PAYMENTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.			23,30,182.96
For Training of Academic Staff at G.S.I. Camp.	--	3,476.00	3,476.00
By International Programmes			
Deputation aborad	1,429.00	29,753 70	31,182.70
Honorarium to Foreign Visiting Scientists	--	—	--
By IV International Palynological Conference	8,672.15	--	8,672.15
By G.P.F. Account			
G.P.F. accounts of Dr H.A. Khan, Mr G.C. Singh & V.S. Panwar remitted to N.B.G. C.D.R.I., & C.S.I.R.	--	1,017.60	1,017.60
G.P.F. Subs, transferred to G.P.F.	7,791.00	84,456.00	92,247.00
G P.F, Addl. D.A. transferred to G.P.F. Suspense A/c	144 00	28,244.70	28,388.70
Recovery of Advances & Interest thereon transferred to G.P.F. A/c	5,161.00	50,101.00	55 262.00
Additional wages from R.P.F. Commissioner, Kanpur disbursed	—	2,807.43	2,807.43
By Miscellaneous			
Income Tax remistted	4,483.00	22,229.00	26,712.00
Insurance Premium			
Total C/o Rs.			25,79,948.54

RECEIPTS	PLAN	NON-PLAN	TOTAL
Total B/F	10,73,267.85	22,07,938.24	32,81,206.09
Total C/o	10,73,267.85	22,07,938.24	32,81,206.09

PAYMENTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs			25,79,948.54
Remitted	4,993.47	35,075.89	40,069.36
C. D. S. (Add. D. A.) Remitted	7,316.00	89,899.00	97,215 00
C T.D. Amount Remitted	110.00	3,970.00	4,080.00
C.D.S. (Wage Account) Remitted		18,380.00	18,380.00
By Govt. of India Scholarship		16,851.61	16,851.61
By loans and advances			
Flood Relief	—	—	—
Festival Advance	—	4,400 00	4,400.00
Conveyance Advance	—	20,000.00	20,000.00
By Oil India Expenses	—	8,352.84	8,352.84
By Expenditure out of Misc. Receipts	—	—	—
By Amount Transferred to C. N. R. Deposit A/c.	—	—	—
By Donation Account Expenses	—	—	—
By investment in F. D. R. at S. B. I.	—	—	—
By Pension & Superannuation	—	21,650.90	21,650.90
By Refund out of Deposits			
To Modern Construction	—	—	—
To Rajiv & Co.	—	—	—
By Closing Balance	2,88,615.00	1,81,642.84	4,70,257.84
Grand Total Rs.	10,73,267.85	22,07,938.24	32,81.206.09

RECEIPTS	PLAN	NON-PLAN	TOTAL
Total B/F	10,73,267.85	22,07,938.24	32,81,206.09
Grand Total Rs.	10,73,267.85	22,07,938 24	32,81,206.09

Closing Balance

	Bank	
	Recurring	Non-Recurring
Plan	31,772.39	2,56,842.61
Non-Plan		
Central Recurring	1,47,310.94	—
Oil India	9,607.78	—
Silver Jubilee	19,635.46	—
Donation & Endowment	5,055.41	—
	1,81,609.41	2,56,842.61
Cash in Hand	33.43	
	1,81,642.84	

Cash	
Recurring	Non-Recurring
—	—
17.27	—
16.16	—
—	—
33.43	

Sd/-Ghanshyam Singh
Accounts Officer
Birbal Sahni Institute
of Palaeobotany
Lucknow

Sd/-Y. B. Singh
Section Officer
A. G. U. P. I.
Allahabad

Sd/-Gurcharan Singh
Registrar
Birbal Sahni Institute
of Palaeobotany
Lucknow

Sd/-G. D. Agarwal
Zonal Audit Officer
Lucknow Zone
Lucknow

Sd/-K R. Surange
Director
Birbal Sahni Institute
of Palaeobotany
Lucknow