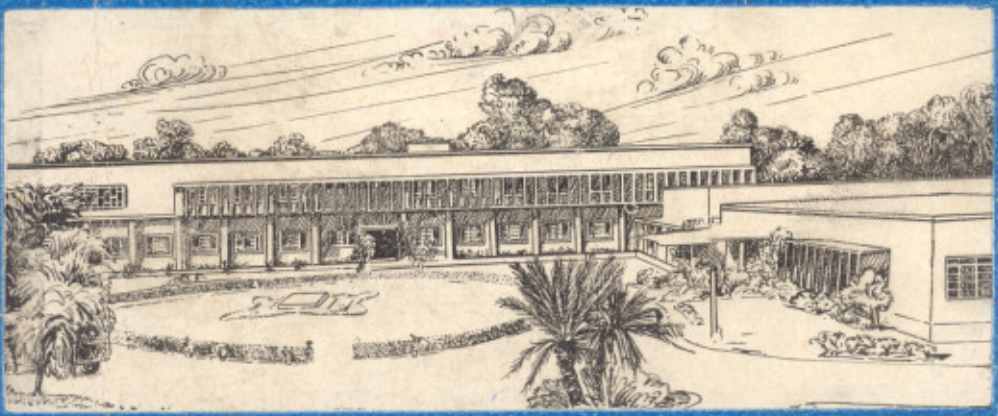
BIRBAL SAHNI INSTITUTE OF PALAEOBOTANY LUCKNOW



ANNUAL REPORT

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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 5th 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 achievements were made under different plan and non-plan projects. Some of the outstanding results are :

1. Definite evidence of the occurrence of micro-biota was found in the Suket shales (about 900 million years old), near Rampura, Madhya Pradesh.

2. For the first time large number of reproductive organs of the important plants of the early coal-formation period (about 250 million years) were found in Orissa. This find is being analysed for tracing the phylogenetic history of these plants.

3. Several reproductive organs associated with certain younger plants have also been identified. These finds throw new light on the relationship of these plants. Particularly interesting is the identification of cycad-like strobili in the Triassic (Nearly 200 million years), and of monocot-like inflorescence in the Early Tertiary (60 million years) deposits.

4. Observations on the pollen and fungal spores in the atmosphere at Lucknow have been finalized. They have important bearing on the diseases in plants and animals, particularly in regard to allergy caused by some of them to man.

5. Remains of cultivated plants were identified from several archaeological sites, significant amongst which were rice and different varieties of wheat.

6. Study of spore and pollen floras has been quite useful in correlation of various sedimentary horizons in Raniganj and Singreni Coalfields. Evidences have been obtained which show that the

change in plant forms did not coincide with the lithological Permian-Triassic boundary, as was supposed earlier.

7. Palynological study of Oil India Project samples from Kharsang 2 section(Assam region)has provided useful information with regard to their stratigraphic position.

8. The setting up of the Radiocarbon Dating Laboratory is well on its way and it is hoped that soon the Institute would be able to take up the dating of samples.

For interdisciplinary studies the Institute worked in close collaboration with the Indian Statistical Institute, Geological Survey of India, Central Fuel Research Institute, National Coal Development Corporation, Oil and Natural Gas Commission, Oil India Ltd., Directorate of Mineral Resources of Meghalaya, and others.

Training in palaeobotanical methodology was provided to several persons, including three foreigners, one each from Bangla Desh, Iran and Nepal. Technical assistance on palaeobotanical and related problems was provided to many individuals and organisations. These include Archaeological Survey of India, Rajasthan State Department of Archaeology and Museum, Gujarat Directorate of Geology and Mining, Neyveli Lignite Corporation, and others.

Quite a few scientists of the Institute participated in National and International Conferences. This year, too, some of them were nominated or elected on various National and International Committees.

An important feature of the publications brought out by the Institute this year is a book entitled "Aspects and

Appraisal of Indian Palaeobotany". This is really a critical review of the entire work done in Indian Palaeobotany so far. It would not only be a handy source of information for research workers but would also serve as a useful guide for teaching of palaeobotany in Indian Universities.

II. RESEARCH

1. PRE-GONDWANA

1. 1. Pre-Gondwana Plant Life

Completed observations on the micro-biota recovered from the Suket shales collected from Rampura (Madhya Pradesh). The micro-biota comprises algae, fungi, and acritarchs. The algae remains are commonly colonial (*Palaeonocystis* and *Myxococcoides)* and rarely filamentous. The fungal remains belong to *Eomycetopsis*. The acritarchs are *Leiosphaeridia, Protoleiosphaeridium, Symplassosphaeridium, Zonosphaeridium* and *Nucellosphaeridium*.

2. LOWER GONDWANAS

2. 1. Morphological Studies in the Glossopteris Flora

2. 1. 1. *Pteridophytes.*

A critical morphological study of *Trizygia speciosa* has been done. 300 specimens collected from the Raniganj Formation of the Raniganj Coalfield have been studied. Size measurements of different plant structures have been taken to understand that the variations in size of the leaf etc. and to find out the height of the plant. This has helped to reconstruct the possible size of the plant and the number of whorls on a single plant. Studies on the epidermal structure of leaves and the anatomical structure of stems have been done by cellulose pull method. A large number of leafless articulated equisetalean stems are associated with the leaf-bearing shoots. In some cases the aerial shoots are in

organic connection to these leafless stems, on the basis of which a reconstruction of the plant has been suggested.

In addition to this, one species of *Paratryzygia* and one new species of *Parasphenophyllum* have been identified.

2. 1. 2. *Gymnosperms.*

Morphological studies of *Glossopteris* leaves collected from Handappa village, Dhenkanal, Orissa. For the identification of species, biometry has been applied. Sixteen types of *Glossopteris* are recognisable.

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

A. *Morphological and cuticular studies of Glossopteris from the Barakar Formation of South Karanpura Coalfield.*

On the basis of morphological and cuticular studies 9 distinct types of *Glossopteris* leaves from the Lower Nakari Seam of South Karanpura Coalfield have been recognised. Of them 5 species are new.

2. 1. 4. *Palaeobotany of Auranga Coalfield.*

Megafossils and miofloral assemblages from the Lower Gondwana horizons of Auranga Coalfield have been completely investigated. Palaeobotanical evidence indicates the presence of Karharbari and Barren Measures which were hitherto not known in the basin.

2. 1. 5. *Glossopteris Flora from Mahanadi and Brahmani Valley, Orissa.*

Gymnospermous reproductive organs from the Glossopteris flora of India have been re-examined.

Eretmonia, *Glossotheca* and *Kendostrobus* are the pollen bearing members. *Denkania*, *Partha*, *Lidgettonia* are the female cupulate types and *Dictyopteridium*, *Scutum*, *Ottokaria* and *Senotheca* are the multiovulate types of female reproductive organs. Most of the female fructifications are subtended by fertile scales possessing *Glossopteris* type of venation The cupulate types show some resemblance with the Lyginopteridaceae, Corystrospermaceae and Peltaspermaceae, although they cannot be assigned to any of these families Provisionally the cupulate types may be put under the Pteridospermales. The multiovulate types are quite distinct from the known Gymnosperm groups, living or fossil, and hence have been put under a new group of Gymnosperms, namely Glossopteridales Thus, there are at least two groups of Gymnosperms, apart from conifers which are present in the Permian Glossopteris flora of the southern hemisphere.

2. 2. Sporae Dispersae and Palynostratigraphy

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

Biometric analysis has been applied systematically to locate the morphographic parameters of monosaccate genera, *Plicatipollenites* and *Potonieisporites* as well as to find out the degree of transition between them. For this purpose samples of Talchir and Karharbari Stages from South Rewa basins and the Talchir of Giridih Coalfield have been completed. Characters such as heteromorphism in tetrad mark, relation between fold system and the overall shape of spore with reference to tetrad mark were taken into consideration and were plotted graphically. The results indicate the possibility of identifying the taxa biometrically.

2. 2. 2. *Miospore assemblage from the Barren Measures of South Karanpura Coalfield.*

Barren Measures of shales from the Nakari Nala Section, South Karanpura Coalfield, have yielded a miospore assemblage comprising 18 genera and 31 species. The genus *Densipollenites* is characteristically abundant.

2. 2. 3. The various aspects of Gondwana Palynology with reference to stratigraphy, palaeogeography and palaeoclimate, floristics and distribution of spore kinds have been discussed in a paper at the 1st Indian Palynological Conference held at Chandigarh.

2. 2. 4. A paper on the Palynostratigraphical study of the bore-core NCRD-6 in the Dishergarh area near Asansol, Raniganj has been finalized.

2. 2. 5. The bore-core NCRD-2 consisting of 56 samples and representing almost the entire Raniganj Formation in Raniganj Coalfield has been palynologically analysed. This study suggests a constant and continuous preponderance of striate disaccate genera within the succession. The rarity of the genus *Densipollenites* and mesosporoid trilete spores in Raniganj mioflora distinguishes it from the Barren Measure and the Lower Panchets respectively. The paper has been sent to Press.

2. 2. 6. Raniganj-Panchet successions were sampled during the month of April, 1974 along the Nonia Nala and Nonia Khal streams, Raniganj Coalfield. The maceration and slide preparation of 39 samples has been completed. Further collections have been made from these sections this year.

2. 2. 7. The palynological study of all the working Coal seams from different areas of Singreni Coalfield were completed. The miofloral Zonation and the correlation studies are almost complete. However, the petrographic studies have not been done owing to the cutting and

polishing machines being still not ready for use and hence results could not be finalized.

2. 2. 8. The shale and shaly sandstones macerated from Talchir Coalfield proved barren of miospores. Maceration of further samples is in progress.

2. 2. 9. The manuscript of the paper entitled "Palynology of some Talchir sediments from Mahendragarh areas, M. P." has been prepared. The paper contains successional palynological analysis of the Talchir sediment exposed in Hasdo and Hasia Nala sections along with the geological field observations.

2. 2. 10. The successional collection of Talchir and Barakar sediments from Betul Coalfield, M. P. has been macerated. The samples have yielded rich mioflora. Palyno-stratigraphical studies are in progress.

2. 2. 11 The taxonomic description of various palynomorphs encountered in the samples from South-Karanpura Coalfield is in progress. The recounting of the samples for quantitative studies has been undertaken.

2. 2. 12. Commencing from the earliest gymnospermous pollen organizations, the various kinds occurring in the successive geological horizons have been correlated on grounds of comparative morphology. Morphographically cohering pollen kinds from various horizons have been interpreted as constituting evolutionary lines out of which some became extinct later and others lead to the extant kinds.

2. 2. 13. Collection of data for morphotaxonomical study of certain trilete miospore genera is continued.

2. 3. Petro-Palynology of Coals

2. 3. 1. The manuscript of the paper entitled "Petrology and Palynostratigraphy of some Wardha Valley coals, Maharashtra, India" has been revised for publication, incorporating some recent information and relevant geological details.

2. 3. 2. Basic Coal types of Lower Gondwana sequence have been determined based on the present knowledge of the composition of coals from different stages. Combination of characters based on the analysis of coals from various Basins have been utilized for grouping the Coal types.

2. 3. 3. The petrographic analysis in conjunction with Palynological studies of Godavari coals could not be completed as the machine section is still out of order.

3. PALAEOZOIC FROM ABROAD

3. 1. 1. Collection of data and cataloguing regarding the palynostratigraphy of Silurian-Devonian of the world is being done.

3. 1. 2. Palynology of Brazil coals is under re-examination.

3. 1. 3. Collection of data for palynostratigraphy of the Permian from all over the world is being done.

4. MESOZOIC

4. 1. Megafossil Assemblages

4. 1. 1. *Triassic Flora.*

Work was carried out on the Lower Triassic floras from Asansol, Auranga Valley, Ramkola-Tatapani and Nidpur regions. In the Early Triassic flora it was found that *Lepidopteris*-like plants appeared first and not *Dicroidium*

which was so far thought to be a Triassic marker. It seems the Early Triassic flora thrived under unfavourable conditions.

Description and photography of *Trizygia speciosa* was completed. A new microsporangiate fructification was described under *Bosea indica* gen. et sp. nov. The fruiting body consists of a thick axis with microsporophylls arranged in opposite or sub-opposite manner. The sporangia are borne on the under surface of microsporophylls. Each sporangium contains *Weylandites*-type of spores. The cuticle of microsporophyll is somewhat like *Lepidopteris indica* Bose & Srivastava. Apart from *Bosea indica*, two other new genera have been described as *Gopadia* (leaf) and *Chakrea* (?fruiting body).

Studies on the Pteridospermous remains from the South Rewa Basin have been started. After photographing the megafossils, cuticular preparations have been made from them.

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

Cycadophytic leaves from the Mesozoic rocks of India have been examined. It is found that most of the leaves described under *Nilssonia* are really Pterophyllums. The work on *Pterophyllum sahnii* and *P. distans* was completed.

From Jatamao in the Jabalpur series a few species of *Cladophlebis*, *Hausmannia* and *Sphenopteris* have been studied. From Sehora a large number of cuticular preparations have been made out of *Brachyphyllum* and *Desmiophyllum*. Their study is in progress. The work on *Elatocladus* and *Pagiophyllum* from the same locality has almost been finalized. The paper will soon be sent to the Press. From Bansa three species of *Ptilophyllum* have been recognized and described. The work on *Elatocladus*, *Desmio-*

phyllum and *Araucarites* is well under progress.

The studies on some pteridophytic remains from Songad in Kathiawar were undertaken. The work on *Dictyophyllum* is in final stages.

From Nipania the figured slides of *Pentoxylon* ("dwarf" and "long" shoots) were re-examined. The object was to observe the primary vascular system of *Pentoxylon* and to compare this with that of other gymnosperms. The supply of leaf-traces in *Pentoxylon* was found to be somewhat similar to *Rhexoxylon*, *Bucklandia* and *Ginkgo*.

A comparative study of some fossil and living members of Matoniaceae and Gleicheniaceae was undertaken.

4. 2. Sporae Dispersae and Palynostratigraphy

4. 2. 1. *Triassic Palynoflora.*

The study of palynomorphs from the greenish-brown mudstones and shales of the Maitur Formation (Panchet Group) exposed in the Nonia Nala, East of Kumarpur, near Asansol, West Bengal was completed and the paper was sent for publication in the *Palaeontographica*. Highlights of the results obtained were published in the *Palaeobotanist*. The miospores belong to 40 genera and 60 species, of which 1 genus, viz., *Playfordiaspora*, and 9 species are new. There are 8 genera and 17 species of megaspores, of which 2 genera and 15 species are new. The Maitur beds above the Raniganj-Panchet contact have abundance of striate bisaccate pollen as in the underlying Raniganj beds. In the beds farther above the contact, the number of trilete forms gradually increases while the bisaccate pollen decrease in frequency. The characteristic genera of the Maitur Formation are *Verrucosisporites*, *Decisporis*, *Playfordiaspora*, *Lunatisporites* sensu stricto, *Banksisporites*, *Pantiella* and

Maiturisporites.

The study of Panchet mioflora from the Sukri River exposure near Kaima, Auranga Coalfield, Bihar was completed and sent for publication. The palynomorphs are assignable to 23 genera and 33 species One genus and 5 species are new. The mioflora is quite similar to the Lower Triassic palynological assemblage obtained from the Maitur Formation of Nonia Nala, West Bengal.

A large number of sporiferous slide preparations from several samples collected from the South Rewa Gondwana basin were scanned for miospores. Rough descriptions of some miospore types were completed. The study is still under progress.

Triassic miofloras known from the territories of Algeria, Tunisia, Lybia, the Saudi Arabian Peninsula, Pakistan, India and Western Australia were reviewed for presentation in the Gondwana Palynology Section of the 1st Indian Palynological Congress held at Chandigarh The paper has been submitted for publication in the *Palaeobotanist.*

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

Study of the mioflora from the Athgarh beds was completed. The paper is being published in the *Palaeobotanist.* The Palynological assemblage comprises 45 species belonging to 29 genera of pollen and spores. The assemblage has a predominance of gymnospermic pollen comprising particularly *Araucariacites* and *Callialasporites.* Pteridophytic spores are meagrely represented. On the basis of the mioflora the age of the Athgarh Formation is tentatively taken as upper Jurassic.

A detailed study of the palynoflora from the Upper

Gondwana of South Rewa Basin is under progress.

4. 2. 3. *Palynostratigraphy of Mesozoic sediments from Sidheshwar Hill Cuttuck, India.*

Six carbonaceous shale samples were macerated and are being scanned. Further maceration of the remaining samples is in progress.

4. 3. Mesozoic from Abroad

4. 3. 1. The Lower Triassic palynological assemblages from Nungumbe on the Lomai River, South-East of Kitenge and from Lualaba Valley at the confluence with Lowa River have been described. The former assemblage is characterized by 20 genera; of them 4 genera belong to triletes, 1 genus to monoletes and 11genera to nonstriate bisaccates. The assemblage is dominated by triletes (73%) and striate and nonstriate bisaccate contribute 15% and 12% respectively. The sample from Lualaba yielded only 9 bisaccate genera and is dominated by *Lunatisporites* (60%).

4. 3. 2. *Palynological studies on some Zirab Coals, Persia.*

Taxonomic study is almost complete. Manuscript is being prepared.

4. 3. 3. *Palynological studies on some Mesozoic Coals of Iran.*

Taxonomic study is in progress.

4. 3. 4. The cataloguing of reprints of Mesozoic palynological section of the library of the Institute is being continued.

5. CENOZOIC

5. 1. Morphological and Anatomical Studies

5. 1. 1. *Deccan Intertrappean Flora.*

Detailed studies were carried out on a new and well preserved angiospermous inflorescence discovered in chert from Mohgaon Kalan. The morphological and anatomical characters of the petrified inflorescence indicate its affinities with monacots, showing a near resemblance to members of the Cyperaceae and Liliaceae.

Six big pieces of palm woods collected from the localities of Parapani and Mehgaon in Mandla district of Madhya Pradesh were sectioned in cross and longitudinal planes for a detailed investigation. All of them were found to be new. One specimen had roots attached. Two of them also showed a prominent lacunar ground tissue indicating a marshy habitat. Attempts are being made to identify them with the modern palms.

About thirty specimens of fossil dicot woods, also collected from Mandla district of Madhya Pradesh, were cut and their sections prepared. A detailed study showed the presence of five new types, resembling the modern woods of *Grewia, Sterculia, Limonia, Cynometra* and a member of the family Euphorbiaceae.

The pollen and spores recovered from the Intertrappean cherts were studied and compared with the modern pollen and spore taxa. This study revealed the pollen of Saxifragaceae, Leguminosae, Anacolaceae, Monimiaceae, Berberidaceae, Convolvulaceae among the angiosperms; spores of Polypodiaceae, Schizaeaceae, Lygodiaceae among the pteridophytes and a variety of fungal spores

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

Studies were carried out on the leaf impressions from

the Eocene of Panandhro Basin. Some of them have been provisionally assigned to the families Meliaceae, Rubiaceae, Guttiferae, Tiliaceae, Lauraceae, Urticaceae and Melastomaceae.

5. 1. 3. *Leaf impressions from the Lower Miocene of Khari River Bed, Kutch.*

Leaf impressions collected from the Khari River bed near Goyala-Mokra, were studied and tentatively assigned to the families Leguminosae, Euphorbiaceae, Combretaceae, Anacardiaceae, Celastraceae, Sapindaceae, Cactaceae, Moraceae, Rutaceae, Lauraceae, Rhamnaceae and Melastomaceae etc.

5. 1. 4. *Fossil woods from Kankawati Series (Manchar), Kutch.*

Further studies on the fossil woods from near Mothala and Dhaneti villages showed the presence of *Podocarpus*, among the coniferae and *Sterculia* of Sterculiaceae and *Dysoxylum* of Meliaceae belonging to the angiosperms. A paper on the wood of *Podocarpus* is ready for Press.

5. 1. 5. *Fossil woods from the Siwalik beds of Nahan.*

Fossil woods collected from Dhaula Kuan near Nahan in the Lower Siwalik beds were sectioned and studied. Majority of them were found to belong to *Dipterocarpus* and *Cynometra*. Four of them have been assigned to new species of the genus *Dipterocarpoxylon*.

5. 1. 6. *Fossil woods from Eastern India.*

(a) *Tipam Series.*

Further studies on the petrified woods from the Miocene

of Tipam sandstones near Hailakandi in Cachar district of Assam revealed the presence of *Mallotus, Albizzia* and a new species of *Glutoxylon* from this area. Modern comparable taxa of all these fossils are still found in the forests of Assam and neighbouring areas.

(b) *Dupitila Series.*

Further detailed investigation was carried out on the fossil woods identified as *Sterculia, Dipterocarpus, Shorea, Garuga, Afzelia-Intsia, Cassia, Albizzia* and a number of the family Lauraceae. Some of them were photographed and described. Attempts are being made to compare them with the modern species. Further investigation of fossil woods collected during November-December, 1974 from Namsang River bed at Deomali and from Jairampur, Arunachal Pradesh is being done.

5. 1. 7. *Fossil woods of the Cuddalore Series.*

A paper on revision of the affinities of previously known woods, viz., *Guttiferoxylon indicum* Ramanujam (1960), *Celastrinoxylon dakshinense* Ramanujam (1960), *Albizzioxylon sahnii* Ramanujam (1960), *Dalbergioxylon antiquum* Ramanujam (1960) and *Dipterocarpoxylon cuddalorense* Navale (1963) was completed and sent for publication.

The affinities of *Hopeoxylon indicum* Navale (1963) and *Shoreoxylon speciosum* Navale (1963) which were described as resembling those of *Hopea* and *Shorea* of the family Dipterocarpaceae were revised. These were found to be very similar with the woods of the Malayan genus *Sindora* of Leguminosae. Besides these, one more fossil wood resembling *Sindora* was identified.

Two more fossil woods already identified were further studied in detail with their modern equivalents, viz., *Chrysophyllum* and *Holoptelea* of the family Sapotaceae and

Ulmaceae respectively. A paper dealing with these woods is almost ready.

Out of a few other woods investigated one was identified as *Sterculia*. This is the first record of Sterculiaceae from the Tertiary rocks of South India.

5. 1. 8. *Plant megafossils from Karewa beds of Kashmir.*

A collection of leaf-impressions from Liddarmarg and Laredura, Kashmir was examined. After clearing these from the shales a few of them were found somewhat different from the leaves described by earlier workers. Attempts are being made to identify them with the modern leaves.

5. 2. Sporae Dispersae and Palynostratigraphy

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

In order to identify the Neogene miospores from Assam and Neyveli lignite of South India, it was thought to have a reference collection of modern pollen taxa representing the pollen flora of India. Consequently pollen slides were prepared from 500 species belonging to 200 genera and 35 families of the angiosperms. These pollen taxa were described and photographed and reference cards prepared for each of them.

Samples of Neyveli lignite were macerated and about 150 slides were prepared and scanned. The pollen and spores are being identified.

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

Taxonomic description and identification of miospore types recovered from samples of Namdang, Baragolas, Ledo and Tipang collieries of Makum coalfield has been done.

5. 2. 3. *Palynopetrographic study of the organic remains in coastal and up-country lignites*

The main seam of Neyveli lignite area consisting of 35 samples and representing the entire thickness has been palynologically analysed. The palynofossils are not abundant. However, the study suggests preponderance of angiospermic and fungal forms. The taxonomic, statistical and evaluation studies are being completed.

5. 2. 4. A classification of dispersed organic tissues of lignites is being worked out from and extensive morphographic study of the lignite biostructures and their assemblage pattern. The study is under progress.

5. 2 5. Some gymnospermous forms have been recognized for the first time in Neyveli lignite. Attempts are being made to identify them.

5. 2. 6. Cataloguing and abstracting of Neogene literature for palynostratigraphic synthesis is in progress.

5. 2. 7. *Palynological study of the Upper Cretaceous-Tertiary sediments of South Shillong Plateau.*

Microphotography of spores and pollen assemblages recovered from earlier collection of Jadukata, Mahadeo and Langpar formations was completed. Morphological study of the palynomorphs photographed is in progress. A field excursion was undertaken to Jadukata River, Mawphlong-Balat road and Cherra-Shella road sections in Meghalaya to test the geological credibility of the marker fossils selected from previously worked out sections.

5. 2. 8. *Palynostratigraphy of Tertiary sediments of Upper Assam for Oil India Project.*

(A) Two hundred and fourteen samples were processed

in the laboratory representing the Tertiary succession encountered in various oil wells drilled at Nahorkatiya, Jorajan and Kharsang areas of Upper Assam and Arunachal Pradesh respectively. About a thousand slides have been prepared of the productive samples.

(B) More than one hundred and fifty slides from different stratigraphic levels of Kharsang 2 section were examined under the microscope. The study is in progress.

(C) Palynological assemblages from samples representing 1920, 1935 A, 1935 B and 1950 metres depth in Kharsang 2 section were studied in detail. The stratigraphic interval covered by these samples is considered to be equivalent to the Girujan basalmost level of Nahorkatiya Reference section.

(D) Palynological assemblages from 3490, 3494 and 3496 metres depths of NHK 368 were examined for environmental interpretation. From the nature and mode of preservation of the microfossils it has been inferred that the stratigraphic horizon represented by the above samples was accumulated in restricted conditions (barred basin). The water of this basin was originally deduced to be acidic, resulting in the destruction of organic matter before it could be converted into hydrocarbon. The above levels were, therefore, considered unfavourable for the accumulation of oil.

(E) An excursion was undertaken to Upper Assam for collecting stratigraphically located samples from some exploratory bore holes of Oil India Ltd., and Assam Oil Company. About 58 palynological rock samples were collected from Digboi (Assam Oil Company) and Jaipur (Directorate of Geology and Mining, Assam) area.

(F) Spores related to Schizeaceae and Parkeriaceae

are richly represented in the Tertiary succession of Assam. They show a great variation in shape, size and ornamentation in almost every stratigraphic level of this region. Therefore, the problem arises as to whether the different kinds of spores can be ascribed to the specific variations of the morphologic characters or they just represent the mutuational variants. In either case, whether or not a solid geological range of distribution of various spores species can be established out of this rich assemblage for resolving the stratigraphic problems is being worked out. In this connection, a good deal of literature has been consulted to carry out a cytogenetical study on the living spores of Schizeaceae and Parkeriaceae. All fossil spores recovered out of the Tertiary sediments of Assam are being sorted out for comparative purposes.

(G) In all 44 faunal slides containing a rich assemblage of foraminifera from the type area of the Tertiary sediments of Assam were provided by Oil India Ltd. These slides were studied in order to refine the Palaeontologic controls in the light of recent advancements. About 200 well preserved specimens of foraminifera from Mahadeo, Langpar, Kopili, Barail and Surma sediments were photomicrographed. Out of this assemblage, 19 genera were identified and their reference cards were made. The photomicrographs of the foraminifera in these cards were supplemented with a brief description, text-figure, horizon and age. The cards have been submitted to Oil India Ltd. Duliajan, Assam.

5. 2. 9. *Palynostratigraphy of Tertiary sediments of Lower Assam–Resolution of the age of Barail equivalent rocks of Garo Hills.*

Laboratory processing of samples already at hand was continued. Scanning has also been done for some of the productive samples. Fresh collections have been made

from the Simsang River and Tura–Dalu road sections during the field excursion carried out in the months of January and February, 1975.

5. 2. 10. *Palynostratigraphy of the Lower Tertiary sediments of Simla–Hills and near Jammu, North India.*

About 165 stratigraphically located rock samples (Subathu sediments) collected last year from the measured sections of the Kalka–Simla Highway, Himachal Pradesh have been chemically processed. Microslides have been made and the productive samples scanned. Several good palynomorphs have been photomicrographed. Some additional palynological productive horizons have been noticed. Almost all the assemblages consist of a variety of hystrichosphaerids and their closely associated marine forms together with a few representatives of pteridophytic spores and gymnospermic as well as angiospermic pollen grains. Fungal spores are also perceptible but are less both in variety and number. Taxonomic observations on the recovered palynomorphs are being continued. Besides, a large number of stratigraphically located rock samples (about 250) from several measured sections between Surla and Jalal around Banethi in Nahan district (Himachal Pradesh) have been collected together with field data.

5. 2. 11. *Palynostratigraphy of the Eocene sediments of Kutch.*

Thirty samples collected from 2 measured sections around Akri have been macerated. Out of these, 12 samples yielded palynological fossils. Slides have been prepared and their scanning is being continued.

5. 2. 12. *Palynostratigraphy of Madh and Kakdi Formations around Matanomadh, Kutch, Gujarat.*

Algal and fungal microfossils recovered from the Matanomadh (= Madh) Formation have been described. Systematic description of other miospores obtained from the same formation is nearing completion.

5. 2. 13. *Cretaceous–Tertiary of South India.*

Ten stratigraphically located samples from a measured section near Pondicherry have been chemically processed for the recovery of microfossils. All samples proved unfossiliferous. 20 samples from the same area were processed for the recovery of Nannofossils but none yielded coccoliths. Taxonomic study of productive samples from the previous is in progress.

Taxonomic study of Dalmiapuram phytoplanktons is also in progress.

Thirty samples from Varkala & 10 from Quilon, western ghats were macerated for the recovery of Dinoflagellates and spores. All proved productive. Slides were prepared and the scanning of microfossils has been completed. 50 samples from Varkala and Quilon were processed for nannofossils but did not prove productive. Microphotography of productive samples along with taxonomic study of Dinoflagellates recovered last year is in progress.

5. 3. Tertiary from Abroad

5. 3. 1. Fossil woods received by the Institute from the Royal Forest Department, Bangkok, Thailand and identified as belonging to *Millettia, Cynometra, Afzelia-Intsia, Anogeissus* and *Diospyros* were photographed and described. A paper on these woods is being prepared for publication.

6. QUATERNARY

6. 1. Pollen Morphology

6. 1. 1. *Rajasthan pollen flora.*

Sixty pollen slides of ten species were prepared and examined palynologically.

Pollen morphology of 153 plant species distributed over different genera and families was studied statistically in order to facilitate the identification of sub-fossil pollen grains recovered from the sediments of Rajasthan.

6. 1. 2. *Nepal pollen flora.*

Pollen grains of two hundred plant species were examined and various palynomorphs photographed. This has been done as an aid towards correct identification of sub-fossil pollen grains from Nepal profiles and also to prepare exhaustive pollen/spore key of the area.

6. 1. 3. *Palynology of Holoptelea integrifolia*

Thirty pollen slides of *Holoptelea integrifolia* of the material from Burma, Madras and Bengal were prepared. The statistical analysis of the pollen characters has been done to find out any variation in the same species growing at distant places.

One paper entitled "Palynology of *Holoptelea integrifolia* has been processed and submitted for publication in the *Palaeobotanist.*

6. 1. 4. *Pollen morphology of Indian flora.*

One hundred index cards comprising pollen diagnoses of Indian modern flora from the book of Erdtman (1972) entitled "Pollen morphology and plant Taxonomy" have been completed.

6. 2. Pollen Analysis

6. 2. 1. *Pollen zonation scheme for W. Himalaya and Nilgiris.*

One soil profile from Kalapani Swamp near Dehradun was investigated pollen analytically. Approximately 4–6 slides for each sample were studied and found that the whole profile was palynologically barren but for the stray occurrence of pollen grains of Gramineae, Cyperaceae, Compositae, Leguminosae, Rosaceae, Chenopod/Amaranths, and *Pinus*. It has however, been found that the absence of pollen grains and spores in the profile is due to the differential pollen preservation owing to the increased pH and oxidation during sedimentation.

The collection of basic data pertaining to geographical distribution, ecological status of the representatives of forests, Ootacamund in Nilgiris and of western India has been accomplished. Reconsideration of the basic data is of prime importance with a view towards reorientation of pollen diagrams constructed from different zones.

6. 2. 2. *Kumaon Himalaya.*

One paper entitled "Pollen analytical reconnaissance of Post Glacial deposits, in Nainital district, Kumaon Himalaya" has been processed and submitted for publication in the *Palaeobotanist*.

6. 2. 3. *Central Himalaya, Nepal*

One soil profile comprising fifty samples and thirty two surface samples and moss cushions from Sankhu, Kathmandu have been macerated.

6. 2. 4. *Gujarat.*

One paper entitled "Pollen analysis of salt flat at

Malvan" was processed and submitted for publication in the *Palaeobotanist.*

6. 2. 5. *Bengal Basin.*

Sixteen samples from Namkhana profile, Sunderbans, Bengal have been pollen analysed. The frequency of pollen and spores present in the samples is very low and therefore 5–10 pollen slides were examined for each sample in order to record at least one hundred pollen and spores. The most important taxa recovered are, *Ruppia, Rhizophora, Bruguira, Ceriops, Sonneratia, Acanthus illicifolius, Suaeda, Acrostichum aureum,* Gramineae and Leguminosae. Some animal remains such as *Concentricitis rubinus* and rotaloid type of microforams have also been encountered.

Eighteen samples from Chaltiya profile (Barind Jungle), Bengal have been macerated.

One paper entitled "Biological degradations of trilets spores from W. Bengal" has been processed and submitted for publication in *Current Science.*

6. 3. Archaeobotany

6. 3. 1. *Harappan plant economy.*

1. *Mohenjo-daro and Chanu-daro, Sindh, W. Pakistan.*

After a comparative statistical studies with the living counterparts the carbonised wheat grains have been identified as *Triticum sphaerococcum, T. compactum* and *T. aestivum.* The various morphographic categories have been photographed.

6. 3. 2. *Kalibangan, Rajasthan.*

(i) Blocks of thirteen charcoal samples have been prepared and all have been dated radiologically.

(ii) The burnt fragments of spikelets in both *Terracotta* cakes and pai have been reinvestigated. The detailed comparative cuticular studies of living as well as carbonised seeds has enabled the identification of these spikelets as wild wheat (*Triticum dicoccum*) rather than to *Hordeum* or *Oryza* as identified by early workers.

On physico-chemical analysis of some translucent dirty clayey crystals sticking to the inner surface of some potsherds has revealed that they are gypsum. The occurrence of gypsum suggests that they were probably stored by the Harappans for retaining the salts and alkalies.

6. 3. 3. *Purana Qila, New Delhi.*

The cuticular studies of impressions and compression on bricks have proved that they belong to cultivated species of rice, i.e. *Oryza sativa.* The sample no. 19 belongs to Gupta Period whereas sample nos. 27, 41 and 45 belong to NBP ware.

6. 4. Aeropalynology

One paper entitled "Air borne pollen grains and fungal spores at Lucknow" has been processed and submitted for publication in the *Palaeobotanist.*

7. RADIOCARBON DATING LABORATORY

7. 1. Construction of Vacuum System for Sample Combustion and Methane Synthesis

The glass manifold systems for sample combustion, carbon dioxide purification, methane synthesis and methane purification have been constructed and thoroughly

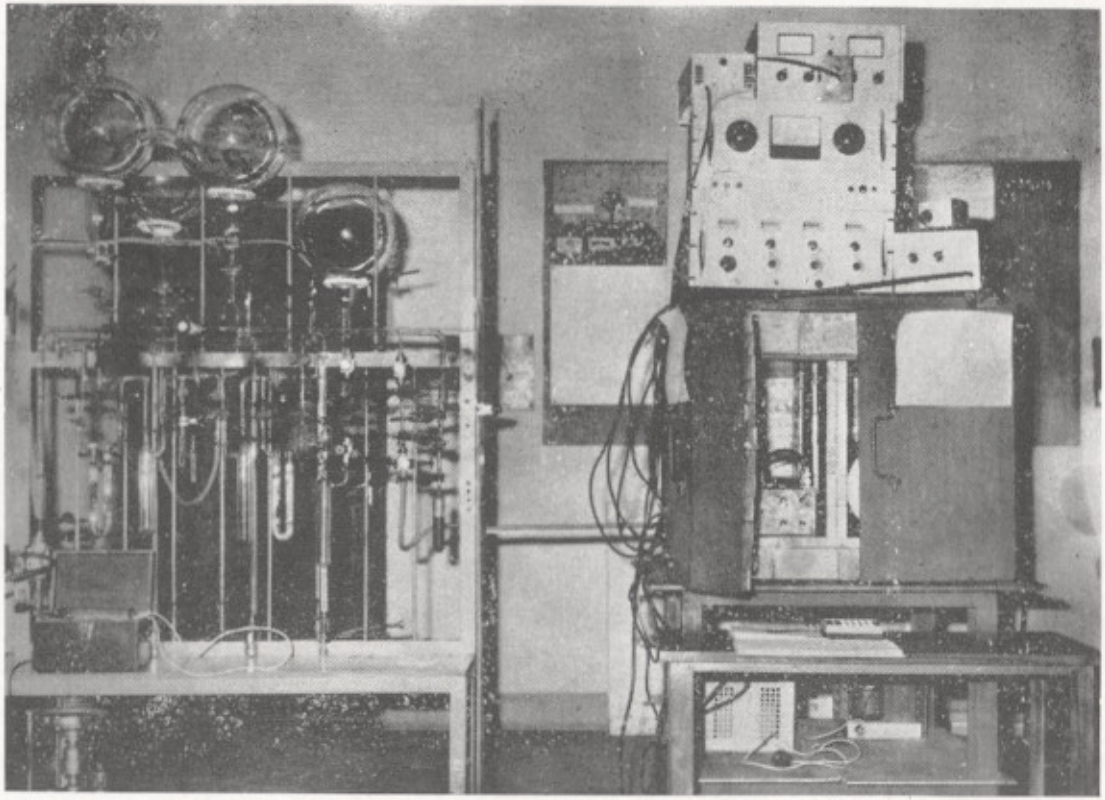
tested. A few background carbon dioxide samples were prepared by anthracite in quartz tubes of indigenous make. These samples have been synthesized to methane in the reaction vessel using hydrogen gas and ruthinium (in aluminium oxide pellets) as catalyst. The synthesized methane samples were purified to check the yield and purity of methane. The maximum yield obtained was only 90%. Purity of the gas is checked in the mass spectrometer in C. D. R. I. Certain modifications in the system and changes in the procedure are being tried out to improve the yield to more than 99%.

7. 2. Low Background Beta Radiation Detection System

A set of anticoincidence electronics units and power supplies for the low background beta radiation detection system has been built using components donated by TIFR earlier. The detector system consists of Geiger guard detectors (ECIL make I–1005,9 nos.) arranged in the form of cylinder with additional maximum coverage for gaps between the counters and loop anode type Geiger counter (ECIL make I–1031) as the central beta detector. A small radio active shield has also been built using lead bricks made from selected low background lead ingots.

The background rate of the detector was reduced to 1.9 counts/min in this set up from 48 counts/min outside the shield and anticoincidence. This system is intended to be used for tracer studies which employ low levels of beta activity radio isotopes.

The high sensitivity low background proportional detector for C–14 Dating has been received from Prof. Oeschger of Bern University. This needs to be refilled with gas and tested for background and efficiency. Since the electronics units and shield for this purpose are not ready yet it is intended to get this testing done at the



Sample Filling System and Counting Set-up of Radiocarbon Dating Laboratory

Radiocarbon Dating Laboratory in Physical Research Laboratory, Ahmedabad. The background methane gas synthesized here will also tested for its radioactive purity in the detector system at Physical Research Laboratory.

7. 3. Glass Blowing Shop

A glass blowing shop equipped with the following items has been set up :

(i) Glass blower table with blast Burner and accessories.

(ii) Air compressor.

(iii) Grinding machine with accessories for making all types of cone joints, high vacuum stop cocks etc.

(iv) Glass cutting machine.

The glass blowing shop has been able to fabricate all types of joints, high vacuum stop-cocks and other glass items needed by the Laboratory in addition to constructing the whole glass system. A glass blowing lathe is to be acquired soon for fabricating Dewar Flasks for liquid air and other items needed by the Laboratory.

7. 4. Construction of Electronics Units

The first set of electronics units for the regular Radiocarbon Dating work is being constructed at the Physical Research Laboratory, Ahmedabad and in the Tata Institute of Fundamental Research, Bombay. These units are almost ready and are being tested. After these units are set up here, construction work on two more systems will be taken up using the same circuit details.

III. PAPERS PUBLISHED

Following papers were published by the staff

Awasthi, N. (1974). Neogene angiospermous woods. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow : 341–358.

Idem (1974). Occurrence of some dipterocarpaceous woods in the Cuddalore series of South India. *Palaeobotanist.* **21**(3) : 339-351.

Bande, M. B. (1974). Two fossil woods from the Deccan Intertrappean beds of Mandla District, Madhya Pradesh. *Geophytology.* **4** (2) : 189-195.

Banerji, Jayasri & Maheshwari, Hari K. (1974). Palynology of the Panchet Group exposed in the Nonia Nala, near Asansol, West Bengal. *Palaeobotanist.* **21** (3) : 368–372.

Bharadwaj, D. C. (1974). Palaeobotany of Talchir and Karharbari Formations of Lower Gondwana glaciation. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow. : 369–385.

Idem (1974). Megafloristic subdivisions of Damuda Series *Ibid.* : 392–397.

Idem (1974). Permian Palynostratigraphy in India. *Proc. III Internat. Palynol. Confer. Novosibirsk USSR. Palyno. Proteroph Palaeopb.* : 125–129.

Idem (1974). "On the classification of Gymnospermous sporae Dispersae. *Symp. Struc. Nomencl. Classif. Pollen & Spores.* Lucknow. : 7–52.

Bharadwaj, D. C. & Kumar, Pramod (1974). Palynostratigraphy of Mesozoic sediments from Machrarar Nala, Bansa, M. P. India. *Geophytology*. **4** (2) : 147-152.

Idem (1974). "Palynostratigraphy of Parsapani Coal M. P., India". *Ibid.* **4** (2) : 184–188.

Bharadwaj, D. C., Tiwari, R. S. & Kar, R. K. (1974). *Crescentipollenites* gen. nov. – A new name for hitherto known *Lunatisporites* Leschik (1955) from the Lower Gondwanas. *Ibid* **4** (2) : 141–146.

Bharadwaj, D. C. Navale G. K. B. & Anand-Prakash (1974). Palynostratigraphy and petrology of Lower Gondwana coals in Pench-Kanhan Coalfield, Satpura Gondwana Basin, M. P., India. *Ibid.* **4** (1) : 7-24.

Bharadwaj, D. C. & Anand-Prakash (1974). Palynostratigraphy of Lower Gondwana sediments from Umrer Aurary, Nagpur Maharashtra, India. *Ibid.* **4** (2) : 130–134.

Bose, M. N. (1974). Bennettitales. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow. : 189–200.

Idem (1974). Triassic Floras. *Ibid.* : 285–293.

Idem (1974). The genus *Otozamites* Braun from the Mesozoic rocks of India. *Palaeontographica.* **147** : 100-106.

Bose, M. N. & Kar, R. K. (1975). Palynologic correlation of the Lukuga Series, Zaire. *Chayanica Geologica.* **1** (1) : 14-24.

Bose, M. N. & Maheshwari, Hari K. (1974). Mesozoic Conifers. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow : 212-223.

Chandra , S. (1974). Ferns and fern-like plants from the Lower Gondwana. *Ibid.* : 62-72.

Idem (1974b). Glossopteris and allied genera : Morphological studies. *Ibid.* : 126-146.

Idem (1974c). Glossopteris and allied genera : Cuticular studies : *Ibid.* : 144-153.

Gupta, H. P. (1973). Quaternary vegetational History of Ootacamund, Nilgiris, S. India—1. Kakathope and Rees Corner. *Palaeobotanist.* **29** (1) : 74-90, 1971.

Idem (1973). Macroscopic plant remains from the Postglacial deposits of Kumaon Hills. *Geophytology.* **3** (1) : 5-12.

Idem (1974). Indian fossil diatoms. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow. : 29-37.

Idem (1974). Late Quaternary vegetational history of Western region. *Ibid.* : 644-650.

Dutta, S. K. , & Sah, S. C. D. (1974). Palynostratigraphy of the sedimentary formations of Assam, India-4. Age of the Laitrynge-Mawkma Coal bearing sandstones and their relationship with the Cherra formation. *Palaeobotanist.* **21** (1) : 48-51.

Jain, K. P. (1974). Fossil Fungi. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow. : 38-46.

Idem (1974). Fossil Dinoflagellates, Acritarchs, Tasmanitids and Nannoplankton. *Ibid.* : 386-602.

Kar, R. K. (1974). Age of the Krols. *Ibid.* : 421-426.

Idem (1974). Palynostratigraphy in western region. *Ibid.* : 561-568.

Lakhanpal, R. N. (1974). Geological history of the Dipterocarpaceae. *Symposium on Phytogeography of Angiosperms. Special Publ.* **1** : 30-39.

Idem (1974). Floristic evidence in the stratigraphical subdivision of the Indian Tertiary. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow. ; 496-501.

Idem (1974). Physical conditions of the Indian Tertiary in the light of Palaeobotanical evidence. *Ibid.* : 516-524.

Lele, K. M. (1974). Palaeozoic monosaccate miospores. *Ibid.* : 231-247.

Lele, K. M. & Chandra, A. (1974). Studies in the Talchir Flora of India-9. Megaspores from the Talchir Formation in the Johilla Coalfield (M. P.) India. *Palaeobotanist.* **21** (2) : 238-247.

Lele, K. M. & Makada, R. (1974). Palaeobotanical evidence on the age of the coal bearing Lower Gondwana Formation in the Jayanti Coalfield, Bihar. *Ibid.* **21** (2) : 81-106.

Lele, K. M. & Srivastava, A. K. (1974). Spicule-like microfossils from the Talchir Formation, Daltonganj Coalfield. Bihar. *Geophytology.* **4** (1) : 25-34.

Maheshwari, Hari K. (1974). Lower Cretaceous Palynoflora from the Bansa Formation, South Rewa Gondwana Basin, India. *Palaeontographica.* **146** Abt. B. (1,2) : 21-55.

Idem (1974). Raniganj-Panchet Boundary. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow. : 408-420.

Idem (1974). Palaeozoic Lycopsida and Sphenopsida. *Ibid.* : 51-61.

Maithy, P. K. (1974). Pre-Gondwana Land plants. *Ibid* : 47-50.

Idem (1974). Gymnospermous wood remains from the Lower *Gondwana*. *Ibid.* : 163-169.

Idem (1974) Megafloristic subdivisions of Damuda Series. *Ibid* : 386-391

Idem (1974). A revision of the Lower Gondwana Sphenopteris from India. *Palaeobotanist*, **21** (1) : 70-80.

Idem (1974). Studies in the *Glossopteris* flora of India 41. *Gondwanophyton* gen. nov. with a revision of allied plant fossils from the Lower Gondwana of India *Ibid.* **21** (3) : 298-304

Idem (1974) *Dichotomopteris*, a new type of fern frond from the Lower Gondwana of India. *Ibid.* : **21** (3) : 365-367

Idem (1974). The Gondwana plants of India and their stratigraphical significance. *7th Intern. Carb. Cong. Krefeld.* : 385–390.

Moler, P. & Rajagopalan, G. (1975). Precipitation Kinetics of $CaCo_3$ in presence of Mg_2 ions. *Zeitsc. Physikal. chem.* Nu. Folg. **94** : 297-314.

Navale, G. K. B. (1974). Petro-palynology of Lower Gondwana coals of India. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow. : 397-407.

Idem (1974) Anthrastructure, Mega and Microfossils of Indian lignites. *Ibid.* : 575-585.

Idem (I974). On the nature and Composition of the Neyveli lignite, South India. *Geophytology*. **4** (1) : 95-101.

Idem (1974). Botanical resolution of some microstructures of Neyveli lignite. *Palaeobotanist*. **21** (3) : 359–364.

Prakash, U. (1974). Palaeogene angiospermous woods. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow. : 306-320.

Prakash, U. & Tripathi, P. P. (1974). Fossil woods from the Tertiary of Assam. *Palaeobotanist*. **21** (3) : 305-316.

Prakash, U., Brezinova, D. & Awasthi, N. (1974). Fossil woods from the Tertiary of South Bohemia. *Palaeontographica*. **147** (4-6) : 107-123.

Sah, S. C. D. (1974). Palaeogene biostratigraphy of Shillong Plateau. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow. : 525-533.

Idem (1974) Age and correlation of the Tura Formation of Assam. *Ibid.* 556-560.

Sah, S. C. D. & Dutta. S. K. (1974). Palynostratigraphy of the sedimentary formations of Assam 3. Biostratigraphic zonation of the Cherra Formation of South Shillong Plateau. *Palaeobotanist*. **21** (1) : 42-47.

Sah, S. C. D. & Kar, R. K. (1974). Palynology of the Tertiary sediments of Palana Rajasthan. *Ibid.* **21** (2) : 163-188.

Sah, S. C. D. & Shah, S. C. (1974). Dubrajpur Formation

and its biozones. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow : 447-451.

Sah, S. C. D. & Singh, R. Y. (1974). Palynological biostratigraphy of the Tura Formation in the type area. *Symposium on Stratigraphic Palynology*, Lucknow. *Spl. Publ.* **3** : 76-98.

Sein, M. K. & Sah, S. C. D. (1974). Palynological demarcation of the Eocene–Oligocene sediments in the Jowai–Badarpur Road Section, Assam. *Ibid.* **3** : 99–105.

Sharma, C. & Singh, G. (1974). Late Quaternary vegetational history in Himachal Pradesh 1. Khajiar Lake. *Palaeobotanist.* **21** (2) : 144–162.

Idem (1974). Late Quaternary vegetational history in Himachal Pradesh 2. Rewalsar Lake. *Ibid.* **21** (3) : 321–332.

Singh, H. P. (1974). Mesozoic cryptogamic spores. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow. 100–110.

Idem (1974). Mesozoic gymnospermous pollen grains. *Ibid.* 270–279.

Idem (1974). Jurassic–Lower Cretaceous Mioflora. *Ibid.* : 299–305.

Sitholey, R. V. & Bose, M. N. (1974). Mesozoic Ginkgoales. *Ibid* 210–211.

Srivastava, Shyam C. (1974). Pteridospermic remains from the Triassic of Nidpur, Madhya Pradesh, India. *Geophytology.* **4** (1) : 54–59.

Idem (1974). Floristic evidence on the age of Gondwana beds near Nidpur, Sidhi District, Madhya Pradesh. *Palaeobotanist*. **21** (2) : 193–210.

Idem (1974). Mesozoic pteridosperms *Aspects and Appraisal of Indian Palaeobotany*, Lucknow : 179–188.

Idem (1974). Triassic microflora. *Ibid.* : 294–298.

Srivastava, Suresh C. (1974) Permian microflora of India. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow. : 278–284.

Srivastava, Suresh C. & Maheshwari, Hari K. (1974). Palynostratigraphy of the Damuda Group in the Brahmini Coalfield, Rajmahal Hills, Bihar. *Geophytology* **4** (1) : 35–45.

Sukh–Dev (1974). Mesozoic pteridophytes. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow. : 73–75.

Sukh–Dev & Bose, M. N. (1974). On some Conifer remains from Bansa, South Rewa Gondwana Basin. *Palaeobotanist*. **21** (1) : 59–69.

Surange, K. R. (1974). The fructification of *Glossopteris*. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow. : 154–162.

Idem (1974). Other Lower Gondwana Gymnospermous plants. *Ibid.* 170–178.

Surange, K. R. & Shaila Chandra (1974a). Fructifications of Glossopteridae from India. *Palaeobotanist*. **21** (1) : 1–17.

Idem (1974b). *Lidgettonia mucronata* sp. nov. a female

fructification from the Lower Gondwana of India. *Ibid.* **21** (1) : 121–26.

Idem (1974c) Some male fructifications of Glossopteridales. *Ibid.* **21** (2) : 255–266.

Idem (1974d). Further observations of *Glossotheca* Surange & Maheshwari, a male fructification of Glossopteridales. *Ibid* **21** (2) : 248–254.

Idem (1975). Morphology of the Gymnospermous fructifications of the Glossopteris flora and their relationships. *Palaeontographica.* Abt. **149** B (5–6). : 153–180.

Tiwari, R. S. (1974). Palaeozoic cryptogamic spores. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow. : 34–99.

Idem (1974). Palaeozoic disaccate pollen. *Ibid.* : 253–269.

Idem (1974). On some problems of nomenclature concerning sporae dispersae. *Symp. Struc. Nomencl. Classif. pollen & spores.* : 70–73.

Idem (1974). Mioflora succession in the African Lower Gondwana. *Proc. III Internat. Palynol. Confer. Novosibirsk USSR. Palynol. Proteroph.* : 130–134.

Idem (1974). Interrelationship of palynofloras in Barakar stage (Lower Gondwana), India. *Geophytology* **4** (2) : 111–129.

Tiwari, R. S. & Anand-Prakash (1974). Miospore assemblage in some Lower Gondwana sediments between Jeer and Daser, Son Valley, M. P., India. *Ibid.* **4** (2) : 135–140.

Vishnu–Mittre (1974). Plant remains and climate from the Late Harappan and other Chalcolithic cultures of India–A study of interrelationships. *Ibid.* **4** (1) : 46–54.

Idem (1974) The boundary problem during the Quaternary in NW Region. *Aspects and Appraisal of Indian Palaeobotany*, Lucknow. : 603–607.

Idem (1974). Environmental changes during the Quaternary. *Ibid.* : 615–631.

Idem (1974). Late Quaternary Palaeobotany and Palynology in India—An Appraisement. *Symp. Late Quat. Veg. Develop. Extra. European Areas. Sp. Publ* **5** : 16-51.

Idem (1974). Neolithic plant economy at Chirand, Bihar. *Palaeobotanist.* **21** : 18-22 (1972).

Idem (1974). The beginnings of Agriculture – Palaeobotanical evidence from India In "*Evolutionary studies in world crops : Diversity and change in the Indian subcontinent*" Ed. Prof. Sir Joseph Hutchinson, Cambridge, U. K. : 3-33.

Vishnu-Mittre & Savithri, R. (1974). Ancient Plant economy at Noh, Rajasthan. *Puratattya.* **7** : 77-80.

IV. FIELD WORK

1. Two members of the Palaeozoic Department visited (i) Raniganj Coalfield, for the collection of megafossils from the Raniganj Formation, and (ii) Hutar Coalfield for megafossils and samples for microfossil study.

2. Director and Museum Curator visited the Handappa fossil localities in the Talchir Coalfield and made a very extensive collection of Glossopteris flora from the Raniganj beds.

3. Excursions have been undertaken by the staff members of the Mesozoic Department to the Jurassic localities of the Rajmahal Hills, Bihar and Triassic localities of Auranga Valley, Bihar, Asansol, West Bengal and Madhya Pradesh during November–December, 1974 and February, 1975. A large number of megafossils and samples for miofloral study were collected.

4. One member of the Mesozoic Department joined a few excursions arranged by the Organizing Committee for the VI Colloque Africain de Micropaleontologie, Tunis. Collected samples from the following localities in Tunisia :

1. Marbous – Middle and Upper Oligocene
2. Saouaf – Upper Miocene
3. Nabeul – Lower Pliocene
4. Djebel Berakine – Eocene (Lutetian)
5. Dj. Bauala – Triassic
6. Raf-Raf – Lower Pliocene and Upper Miocene

He also collected some Jurassic fossil plants from Etrochey, France.

5. Three members of the Cenozoic Department went on an excursion to North-Eastern India during November-December, 1974 and visited Tertiary localities of Meghalaya, Assam and Arunachal Pradesh. Leaf-impressions and Polliniferous samples were collected from the Eocene beds near Laitryngew in Meghalaya, and fossil woods from the Tipam sandstones at Katikcherra and Sultanicherra in Assam, and also from Namsang River Bed near Deomali in Arunachal Pradesh. Some polliniferous samples were also collected from near Namchik.

6. One member of the Cenozoic Department visited Meerut to discuss the identification of an angiospermous inflorescence, from the Deccan Intertrappean beds, with Professor V. Puri of the Institute of Advanced Studies, Meerut University, Meerut.

7. Three members of the Quaternary Department surveyed Dehradun division under Western Himalaya in order to collect pollen profiles and surface samples etc. In addition to this polleniferous material from F. R. I., Dehradun was also collected.

8. Three members of the Quaternary Department surveyed Rajasthan and collected soil profiles and surface samples from several sites, viz , Sambha (Jaipur) Didwana (Nagpur), Pushkar and Budha-Pushkar (Ajmer), Kailana and Balsamand (Jodhpur) The polleniferous materials were also collected from the Herbaria of Botany Department, Jodhpur University and Central Arid Zone Research Institute, Jodhpur.

9. Three members of the Coal Department visited various areas in the Satpura Gondwana Basin (February-March, 1975) for structural studies of the basin and collection of samples for palynostratigraphic studies.

10. Four members of the Coal Department visited various areas in Raniganj East Bokaro, West Bokaro and North Karanpura coalfield (December, 1974 – January, 1975) for evaluation of coals and collection of samples for palynostratigraphic and petrographic work.

11. Two members of the Oil Department went on field excursion from 30th December, 1974 – 1st March, 1975. The object of the field party was to collect stratigraphically located samples from Tertiary and Pre-Tertiary

formations of Meghalaya and Assam. About 35 square kilometres of the area around Garampani, North Cachar Hills was geologically mapped on a large scale (1 : 15840). About 500 stratigraphically located samples were collected from 19 measured stratigraphic sections.

12. One member of the Oil Department visited Kutch during December – January (1974-75) and collected palynological samples from measured sections near Akri, Panandhro, Baranda Waior and adjacent localities. He also visited Ahmedabad on 24 March, 1975 to discuss with the Director, Directorate of Geology and Mining, Government of Gujarat regarding collaborative research programme with the Department of Oil Palynology of the Institute and Directorate of Geology and Mining, Government of Gujarat.

13. Two members of the Oil Department in collaboration with the Geological Survey of India undertook field excursion to several localities in the district of Nahan, Himachal Pradesh. Several sections were measured between Surla and Jalal. About 250 stratigraphically located rock samples were collected from the Lower Tertiary sediments.

14. One member of Oil Department went for field excursion to Cauvery Basin and western ghats from 1st March to 25th March 1975. The object of the excursion was to collect stratigraphically located samples from Pondicherry, Ariyalur, Kallakudi, Warkalli, and Paddappakara representing Cretaceous-Tertiary formations.

V. SPONSORED/COLLABORATIVE RESEARCH

A. Mesozoic Department

Studies on the micro-and mega-plant remains from the Jurassic of Central India were continued in collaboration with the Indian Statistical Institute, Calcutta.

Dr. Sukh Dev has been recognised as a research guide of Mr. B. P. Patra, Geology Department, Utkal University for Ph.D. thesis. The work will be done partly at the Utkal University and partly in the Institute. The thesis will be based on material collected by Mr. Patra from the Atgarh basin.

B. Cenozoic Department

Continued the study of fossil woods from the Tertiary of Blue Nile Valley, Ethiopia, with Prof. Y. Lemoigne, University of Lyon, France.

C. Coal Department

(i) G. S. I., C. F. R. I., Coal Survey Laboratories, N. C. D. C., N. L. C. organizations

(ii) I. C. C. P. and I. C. P.

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 I. Stratigraphic resolution of Komarrah basin on the basis of microfossils (Project in collaboration with Directorate of Mineral Resources, Meghalaya).

(iii) Biostratigraphic studies of phytoplankton in the Marine Tertiary of Kutch and adjoining areas (in collaboration with Geology Department, Lucknow University, Lucknow).

VI. TRAINING PROVIDED TO OUTSIDERS

(i) Mr. M. D. Kajale Deccan College, Poona.

(ii)	Mr. D. K. Shukla	Allahabad University, Allahabad.
(iii)	Shri M. S. Rawat (Asstt. Professor)	Botany Department, Govt. Degree College, Sehore (M. P.).
(iv)	Shri F. Mojab (Asstt. Professor)	Department of Geology, College of Arts and Science, Pahalavi University, Shiraz, Iran.
(v)	Shri V. S. Chetri (Senior Geologist)	Nepal Geological Survey, Kathmandu, Nepal.
(vi)	Shri A. T. M. Fazul Haque	Department of Geology, University of Dacca, Dacca, Bangla Desh.

VII TECHNICAL ASSISTANCE TO OUTSIDERS

(i)	Identification of Mega-fossils and miospores from Lower Gondwanas of East Bokaro and Jharia Coalfield.	Dr. Arabinda Ghosh, Department of Geological Science, Jadavpur University, Calcutta–33.
(ii)	Identification of fossil woods from the Deccan Intertrappean beds and consultation of literature.	Mr. K. S. Patil, Kasturba Walchand College, Sangli, Maharashtra.
(iii)	Identification of fossil plants from the Eocene beds of Deccan Intertrappean Series and consultation of literature and Palaeozoic fossil plants.	Mr. D. G. Varadpande, Department of Botany, Poona University, Poona.

(iv) Department of Ancient Indian History, Culture and Archaeology University of Allahabad.

(v) Archaeological Survey of India.

(vi) Deccan College, Poona.

(vii) Department of Archaeology and Museum, Govt. of Rajasthan.

(viii) Gujarat Directorate of Geology and Mining.

(ix) Neyveli lignite Corporation of India.

(x) Palynological Consultant	Dr. S.C.D. Sah	(1) Oil India Ltd., Duliajan, Assam.
		(2) Directorate of Mineral Resources, Government of Meghalaya.

The following executives of Oil India visited the Department of Oil Palynology to study the Palynological succession through the Tertiary rocks of Assam especially in reference to their oil exploration programmes :

Shri J. M. B. Barua	19 June, 1974 to 25 June, 1974
Shri A. Mukhopadhyay	10 December, 1974 to 19 December, 1974

VIII. PAPERS AND LECTURES AT SYMPOSIA/ CONFERENCE/MEETING

Evolution of Gymnospermous organizations	D. C. Bharadwaj	9th Annual Lecture of the Palynological Society of India.
The various Aspects of Gondwana Palynology	D. C. Bharadwaj	Chairman's address to the Gondwana Palynological Section.
Some fertile organs associated with the leaves of *Glossopteris* and *Dicroidium*.	M. N. Bose	Laboratoire de-95–Palaeobotanique, University de Paris.
The male and female fructifications of *Glossopteris*.	M. N. Bose	The Palaeobotany and Palynology Laboratory, State University of Utrecht.
Recent Advances in Gondwana Palaeobotany	M. N. Bose	Geology Institute, University of Oslo.
History of Flora– Palaeobotanical and Pollen analytical methods.	Vishnu-Mittre	Forest Research Institute, Dehra Dun.
History of Indian floristics-Present position.	Vishnu-Mittre	Forest Research Institute, Dehra Dun.
Palaeobotanical evidence for the History of cultivated plants.	Vishnu-Mittre	Central Drug Research Institute, Lucknow under the auspices of Indian Science Congress.

Pollen grains and spores–our friends and foes.	Vishnu-Mittre	Christian College, Lucknow.
Glossopteris flora of India.	Vishnu-Mittre	Meerut University, Meerut.
The distribution of modern gymnosperms in India.	Vishnu-Mittre	Meerut University, Meerut.
Pentoxyleae and Progymnosperms	Vishnu-Mittre	Meerut University, Meerut.
The classification and evolution of Psilophytalean complex	Vishnu–Mittre	Meerut University, Meerut.
Nomenclature of fossil dicot woods : Irregularities and suggestions.	U. Prakash	Birbal Sahni Institute of Palaeobotany Seminar.
Ultramicroscopy in Palynology.	K. M. Lele	—do—
Lower Gondwana Genetic Coal types.	G. K. B. Navale	—do—
Palynology of the Main Seam of the Neyveli Lignite.	G. K. B. Navale	1st Indian Palynological Congress held at Chandigarh.
Status of Tertiary Palynology in Northern India.	H. P. Singh	Birbal Sahni Institute of Palaeobotany, Seminar.
Cretaceous microplank-	K. P.	Marine plankton and

ton from Senegal Basin N.W. Africa Pt.2 : Taxonomy and biostratigraphy.	Jain	sediments and third Planktonic Conference Kiel, W. Germany.
Indian Lower Gondwana, Pteridophytes.	P. K. Maithy	Birbal Sahni Institute of Palaeobotany Seminar.
Some aspects of Glossopteris flora.	P. K. Maithy	4th Special meeting of 39th Session of Botanical Society of West Bengal, Science College, Calcutta.
Triassic mioflora South of Tethys.	Hari K. Maheshwari	Palynological Congress, Chandigarh.
Miofloristics of Raniganj Stage, Lower Gondwana.	R. S. Tiwari	Birbal Sahni Institute of Palaeobotany Seminar.
Permian Palynofloras South of Tethys.	R. S. Tiwari	1st Indian Palynological Congress, Chandigarh.
Aspects and prospects of Tertiary Palynology in Western India.	R.K. Kar	Birbal Sahni Institute of Palaeobotany Seminar.
Fossil flora of the Cuddalore Series and its modern allies.	N. Awasthi	—do—
Vegetation and palynology of Bengal Estuary.	H. P. Gupta	—do—
Glossopteris fructifica-	Shaila	Birbal Sahni Institute

tion from Indian and their systematic position.	Chandra	of Palaeobotany Seminar.
Some structural problems related to Lower Gondwana Strata in northern parts of Satpura Gondwana Basin.	Anand-Prakash	—do—
Jurassic miofloras South of Tethys.	Pramod Kumar	—do—
Palynostratigraphy of the Eocene sediments in the Shillong Plateau.	R. Y. Singh	—do—
A new fossil florule from the Deccan Intertrappean Series.	M. B. Bande	—do—
Measurements of stratigraphic sections.	S. K. Kulshreshtha	—do—
Palynology and stratigraphy of Matanomadh Formation in the type area.	R. K. Saxena	—do—
Fossil flora from the Lower Gondwana of Auranga Coalfield.	A. K. Srivastava	—do—
Stratigraphy of Shillong-Jowai-Badarpur Road Section.	N. C. Mehrotra	—do—
Palaeobiology of Vindhyan.	Manoj Shukla	—do—

Microfossils from the Deccan Intertrappean Series.	K. Ambwani	Birbal Sahni Institute of Palaeobotany Seminar.
The importance of anatomical studies in the identification of remains of food grains.	R. Savithri	—do—
Some observations on the Glossopteris from the Barakar Formation of South Karanpura Coalfield.	Reshma Bijlani	—do—
Fossil flora from the Tertiary of Kutch.	J. S. Guleria	—do—

IX. REPRESENTATION ON COMMITTEES/BOARDS

1. K. R. Surange ... Secretary, Editorial Board, The Palaeobotanist.
   Organizer, Working Group in Palaeobotany and Palynology of the International Union of Geological Sciences Sub-commission on Gondwana Stratigraphy.
   Member, Sub-commission, VIII International Congress of Carboniferous stratigraphy and Geology under IUGS.

2. R. N. Lakhanpal ... Member, Editorial Board, The Palaeobotanist.
   Member, Apex Committee for the IV I. P. C.

		Editor, Catalogue of Indian Fossil Plants.
3. D. C. Bharadwaj	...	Vice-President, International Committee on Palynology. Chairman, Organizing Committee, IV I. P. C. Member, International Commission on Carboniferous stratigraphy. Member, Editorial Board of "Review Palaeobotany & Palynology, Palaeobotany & Geophytology.
4. M. N. Bose	...	Member, Editorial Board, The Palaeobotanist. Member, Executive Committee, The Palaeobotanical Society. Member, Apex Committee, IV I. P. C.
5. Vishnu-Mittre	...	Member, Central Advisory Board for Archaeology, Govt. of India. Member, Advisory Board, World Pollen Flora. Convener, Sub-Committee, History of Biological Sciences in India for Indian National Committee for International Union of History and Philosophy of Science. Vice-Chairman, Organizing Committee, IV I. P. C.

		Member, Apex Committee for IV International Palynological Conference, Lucknow.
6. 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.
7. U Prakash	...	Chief Editor, Geophytology (Since January, 1975).
8. K. M. Lele	...	Secretary, Publication Section, Organizing Committee, IV I. P. C. Chief Editor, Geophytology (Till December, 1974).
9. 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 Analysis. Member, Organizing Committee of Indian National Committee of Coal Petrology.

Secretary, Organizing Committee, IV I. P. C.

10. H. P. Singh ... Secretary, Organizing Committee, IV I. P. C.
Member, Committee of the Bibliography of Indian Palynology.

11. K. P. Jain ... Assistant Editor, Geophytology.
Secretary, Organizing Committee, IV I. P C.
Member, Executive Committee, The Palaeobotanical Society.

12. P. K. Maithy ... Additional Secretary, Organizing Committee, IV I. P. C.
Editor, Geophytology.

13 H. K. Maheshwari ... Member, Committee for Fossil Plants, International Association for Plant Taxonomy (I. A. P. T.)
Editor, Catalogue of Indian Fossil Plants.
Additional Secretary, Organizing Committee, IV I. P. C.

14. R. S. Tiwari ... Joint Secretary, The Palaeobotanical Society.
Additional Secretary, Organizing Committee for the IV I. P. C.

15. R. K. Kar ... Assistant Secretary, Organizing

		Committee, IV I. P. C. Foundation Fellow, Indian National Earth Sciences Academy, Calcutta.
16.	N. Awasthi ...	Editor, Catalogue of Indian Fossil Plants.
17.	H. P. Gupta ...	Additional Secretary, Organizing Committee, IV I. P. C. Member, Bibliography of Quaternary Palynology, Indian Palynological Society, N. B. G., Lucknow.
18.	S. C. Srivastava ...	Member, Organizing Committee, IV I. P. C.
19.	Anand-Prakash ...	Member, Organizing Committee, IV I. P. C.
20.	Pramod Kumar ...	Member, Organizing Committee, IV I. P. C.
21.	Mrs. C. Sharma ...	Member, Organizing Committee, IV I. P C.
22	R. Y. Singh ...	Member, Organizing Committee, IV I. P. C.

X. DEPUTATION/TRAINING/STUDY ABROAD

1.	Dr. M. N. Bose	Visited the following countries during 3rd April – 19th May, 1974 : FRANCE : Visited Labora-

toire de Paleobotanique, Universite de Lyon I and examined some of the type specimens of Saporta and Dr. Barales collections of Jurassic plants. Also visited the Geology Department of the University of Dijon where too, some of the type specimens of Saporta were available for examination.

Spent a few days in Paris, working mainly at the Laboratoire Palcobotanique, Museum de Histoire Naturelle and Laboratoire de Paleobotanique, Universite de Paris.

BELGIUM : (12th April—26th April, 1974) Worked mainly at the Musee Royal de l 'Afrique Centrale, Tervuren to complete the manuscript of a paper on "A palynological reconnaissance of the Mesozoic sediments of Zaire." Sorted out a large number of samples from Zaire which have now arrived here. Also brought a few samples of living woods from Zaire for our xylarium.

HOLLAND : (26th April–28th April, 1974) Visited the Palaeobotany and Palynology Laboratory, the State University of Utrecht and the Riksherbarium,

Leiden. At the former laboratory saw some interesting fossil collections from the Jurassic of Yorkshire and Permo-Triassic of Italian Alps.

SWEDEN : (28th April—5th May, 1974) Spent most of the time at the Palaeobotany Section of the Riksmuseum in Stockholm, and examined many interesting plant collections from the Southern Hemisphere (Graham Land, Terra del Fuego, Australia etc.).

NORWAY (5th May—12th May, 1974) Besides examining the Triassic collection from the Umkamas of S. Africa brought pieces of cuticle from different genera for comparison and some samples for maceration. Also examined collections of Triassic plants from Argentina and Palaeozoic plants from Uganda at the Geology Institute, University of Oslo.

Was invited to visit the Norsk Polar Institute for identification of certain Palaeozoic plants from the Antarctica.

U.S.S.R. (12th May–19th May, 1974) At the Geological Institute of the Academy of Sciences, Moscow he was shown collections of Mesozoic plants from North Caucasus,

Dagestan, Middle Asia (Darvez, N. E. Kazakistan), Tunguska basin, East Siberia and Georgia.

In Leningrad spent most of his time at the Geology Museum and Komarov Botanic Garden mainly seeing Mesozoic collections from Central Russia, Siberia, China, Amur, Kamenka, Caucasus and Turkistan.

Before he left U. S. S. R., Prof. Vakrameev presented him the following specimens :

Hausmannia leeiana Sze
Klukia westii (fertile)
Coniopteris burejensis (fertile)
Coniopteris angustiloba (fertile)

2. Dr. K. P. Jain ... KEIL (West Germany) to attend the Symposium "Marine Plankton and Sediments and Third Planktonic Conference" from 9th to 13th September, 1974. Afterwards visited Geologische Palaeontologische Institut der Universitat, Frankfurt (W. Germany). Thereafter spent three weeks in U. K. attending Joint-International symposium on "The evolutionary significance of the Exine" and visited research laboratories/centres

and Museums at the invitation of The British Council, London.

XI. FOUNDER'S DAY CELEBRATIONS

(1) On the morning of 14th November, 1974, the birthday of Professor Birbal Sahni, F. R. S., wreaths and flowers were placed on his Samadhi.

(2) The Founder's Day celebrations were held on 18th November, 1974. The deliberations started at 5.00 p.m Shri A. K. Mustafy, Vice-Chancellor, Lucknow University, Lucknow 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 5.45 p. m. Dr. M. R. Sahni, Hony. Professor of Geology, Punjab University, Chandigarh, delivered the 22nd Sir Albert Charles Memorial Lecture entitled "Early Biota of South Asia".

Professor K. R. Surange, Director thanked the Guests.

(3) Professor C. V. Subramanian, Director, Centre for Advanced Studies, University Botany Laboratory, Madras delivered the 4th Professor Birbal Sahni Memorial Lecture entitled "Moulds, mushrooms and men" on Tuesday, the 19th November, 1974 at 5.30 p. m. at the Birbal Sahni Institute of Palaeobotany, Lucknow.

(4) Dr. D. Lal, Director, Physical Research Laboratory, Ahmedabad delivered the 4th Silver Jubilee Commemoration Lecture entitled "Fruits of exploration of moon and neighbouring planets of the solar system" on 20th November, 1974 at 5.30 p. m. at the Birbal Sahni Institute of Palaeobotany, Lucknow.

XII. PUBLICATIONS

1. The Journal ... The Palaeobotanist

(a) Volume 21, numbers 1 to 3 were published during the year.

(b) Volume 22, number 1 and 2 were sent to the Press. Galley proofs of Volume 22 (1) were received from the Press. They were duly corrected and returned.

2. Seward Memorial Lecture

The XX Lecture was received from the Press and the XXI Lecture "Polystely, primary, xylem and the ptero psida" by Professor Wilson N. Stewart was sent to the Press.

3. Birbal Sahni Memorial Lecture

The Galley proof of the third lecture "The theory of Continental Drift in the light of recent researches" by Professor D. D Pant was returned duly corrected to the Press.

4. Silver Jubilee Lecture

The second lecture was received from the Press. The third lecture "Biology of the Mistletoes" by Prof. B. M. Johri was not received from the author and will be sent to Press on receipt.

5. Symposia Numbers

All the five numbers were received from the Press.

6. Proceeding of the Autumn School
(*Aspects and Appraisal of Indian Palaeobotany*).

This was received from the Press.

7. Annual Report

The Annual Report for the year 1973–74 was received and distributed.

8. Sale

During 1974–75 an income of Rs. 45,257.60 was registered from sale proceeds of Institute's publications. The sum included the following foreign exchagge earned :

U. S. $ 2,703.94

£. 189.95

XIII. LIBRARY

1. Statement Showing the details of Stock for the Year 1974-75

Sl.No.	Details	Position on 31.3.74	Added during 1974-75	Total
1.	Books	2,732	102	2834
2.	Issues of Journals	5,854	216	6070
3.	Reprints	21,569	687	22256
4.	Microfilms	207	7	214
5.	Theses	7	2	9
6.	Maps	22	2	24

2. Exchange

(i) Number of papers purchased for exchange 28

(ii) Total number of reprints sent out on exchange 2,179

(iii) Number of individuals on exchange 302

(iv) Number of institutions on exchange 61

(v) Sets of papers of Professor Birbal Sahni sent out 3

3. Visitors to the Library

As usual, the available reading material on Palaeobotany and its related topics was consulted by a number of out side scientists and research scholars. In addition, literature was also loaned to the various Universities for consultation within a given period. These are:

1. Calicut University Library, Calicut.
2. Geology Department, Lucknow University, Lucknow.
3. Botany Department, Lucknow University, Lucknow.
4. Physical Research Laboratory, Ahmedabad.
5. Botany Department, Osmania University, Hyderabad.

4. Maintenance

(i) A large number of out-of-print and rare books and periodicals were reconditioned. The covers in many of the reprints were replaced.

(ii) The number of scientific journals bound during the year rose to 800.

5. Improvements in the Library Functions over the Previous Years

(i) *Classifications*—A scheme using Dewey-Decimal classification system was followed in classifying the books. These numbers were marked on the catalogue cards, book plates, charging book-cards and

the spine of the books, along with the cutter book numbers. These two numbers greatly facilitate in fixing exact locations of the books.

(ii) *Cataloguing*—For the purpose of making the contact between a book and its readers easier, greater stress was laid on development of subject-catalogue Each document was analysed facet-wise and each facet was put as a heading to a card giving comprehensive information about the book. These cards were arranged alphabetically. This enhanced to a great extent, the potential of the catalogue in providing the requisit information.

(iii) *Bibliography*—A comprehensive bibliography of all the journals present in the library was compiled using alphabetical order. Copies of it were exchanged with various reputed scientific research libraries to form an information pool, though of simplest form yet a major help in inter-library-exchange programme.

(iv) *Circulation*—Using the new method of circulation started during the last year, the Library was able to cater to the need and growing number of registered borrowers. The number of them increased 69 to 81 during the year.

XIV. MUSEUM

A. Exhibition Halls

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

All the reconstruction models of this hall have been repainted and the broken ones have been repaired. Labels and legends of the show cases have been checked up and

necessary corrections made therein. Mastic varnish has been applied on the paintings in the wall show cases. A cyclostyled booklet containing all the major informations about the exhibits will be out soon.

2. Botany Hall (Hall No. 2)

This Hall still remains closed for the visitors as the steel cabinets meant for storing types and figured specimens and other wooden furnitures are laying here.

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

Printed labels have been fixed up on the rack shelves indicating the year of collection, horizon, locality and the name of the field party. Display boards have been kept on the side of these racks showing department-wise collection. Some space has been provided for registering the newly collected material. Cataloguing of the material in this Hall has almost been completed.

C. Type and Figured Specimens/Slides etc.

The type and figured specimens and slides are kept in Professor Sahni's room as the basement corridor is still not considered safe. Their number as on 31.3.1975 is as follows :

Type and figured specimens	1159
Type and figured slides	4801
Negative of type figured specimens and slides.	3357

The type and figured specimens are being checked up with the concerned papers. More than half of them have already been checked up likewise and are being kept in a

most systematic manner. The number of the statement, total number of specimens, author/s, journal, year of publication have been briefly pasted on the card board boxes containing these specimens. Details of various specimens in accordance with the explanation of plates have been pasted inside the boxes. The lectotypes or the syntype would be named in due course. Negatives of various functions held in the institute have now been registered by the museum and these have been stored properly.

While numbering the holotype and figured specimens expression is now made to indicate the locality number as well.

D. New Collections

During this year collections have been made from about 89 localities of India by the Institute staff. The details are as follows :

Palaeozoic	261	Specimens & samples (Approx.)
Mesozoic	1375	"
Cenozoic	1058	"
Quaternary	320	"
Oil Department	125	"
Coal Department	354	"

Fresh collections have been properly registered and the individual megafossils and petrified woods have been numbered. A duplicate copy of the list detailing the number of the specimens or samples, their locality number as allotted by the Museum etc., has been issued to the leader of the excursions, for maintaining his own record. This has been found to be useful.

The new collection has been properly stored in the racks.

E. Excursions

One member of the museum visited (i) Jairampur, Arunachal Pradesh for collection of large petrified woods and to find out new fossils localities in and around the adjoining area on the information of the Forest Department, Arunachal Pradesh, (ii) Sikkim for collecting marine Permo Carboniferous samples for microfossils studies. (iii) Handappa, Orissa to collect plant fossils mainly for display in the Museum.

The collections are excellent and suitable ones would be displayed in the museum after the identification is complete.

F. Conferences, Seminars etc.

1. All India Museum Conference 1974, Mathura.	Dr. Anil Chandra	Organization and Development of small Museum including site museum, Mathura.
2. Architecture in South and South East Asia, New Delhi.	Dr. Anil Chandra	Regional Seminar on museums, New Delhi.

G. Presentation of Duplicate Fossils

Representative plant fossils from different eras of India have been presented to the following :

1. Professor H. P. Banks
   Department of Botany, Plant Service Building,
   Cornell University, Ithaca, New York–14850-U.S.A.

2. Professor W. N. Stewart,
Department of Botany, University of Alberta,
Edmonton, Alberta, (Canada).

3. Professor & Head of the Department of Biology,
Guru Nanak University, Amritsar, Punjab.

4. Head, Department of Botany,
Feroz Gandhi College, Rae-Bareli.

H. Visitors from the Institutions

The following 9 institutions visited our Museum, viz., (i) State Institute of Scientific Education, U. P., Allahabad (ii) Geology Department, Ranchi University, Ranchi (iii) Post-Graduate Students, Geology Department, D.B.S. College, Dehra Dun (iv) Department of Botany, Osmania University, Hyderabad (v) Department of Geology & Geophysics, University of Roorkee, Roorkee (vi) Department of Geology, Jammu University, Jammu (vii) Rajendra College, Chapra, Bihar (viii) Agriculture Department, Calcutta University, Calcutta (ix) Department of Botany, Christ Church College, Kanpur.

I. Presentation to the Museum

(i) Professor V. A. Vakhramev of USSR has presented 4 plants fossil specimens from lower part of Neocanian and Middle Jurassic stage of Russia

(ii) Professor Stewart of Canada has presented 11 plant fossil specimens from Upper Devonian, Palaeocene, Miocene, and Upper Cretaceous formations of Canada.

(iii) Prof. H. P. Banks, Cornell University, Ithaca, U.S.A. has presented one plant fossil specimen of Pather Mount Formation.

J. Natural History Museum, New Delhi

A large number of plant fossils covering almost all geological horizons of India have been presented to the Natural History Museum, Department of Science and Technology, Government of India, F. I. C. C. I. Museum-Building, Barakhamba Road, New Delhi for display in their palaeobotanical gallery.

XV. HERBARIUM

Herbarium Specimens

Addition of plant specimens during the year	322
Total number of plant specimens as on 31.3.75	9748

Fruit and Seed Specimens

Addition of fruits and seeds during the year	50
Total number of fruits and seeds as on 31.3.75	971

Woods

Addition of wood samples during the year	25
Total number of wood specimens as on 31.3.74	2596
Total number of wood slides as on 31.3.75	2062

Pollen Slides

Addition of pollen slides during the year	111
Total number of pollen slides as on 31.3.75	8133

Other Slides

Total number of slides as on 31.3.75	4632

A joint expedition in collaboration with Botanical Survey of India, Eastern Circle, Shillong was organized to collect plant specimens from Garo Hills and Khasi Hills. About 180 plant specimens were collected from different

places of the above two localities. During the stay at Shillong, confirmation of identification of about 100 plant specimens collected by Professor Takhtajan and U. Prakash and few collected in the previous years by B. D. Sharma were authentically done. Three wood logs for our Xylarium were also collected from Khasi Hills which were only confined to this area.

Another tour was organized to procure wood samples for our Xylarium in order to have stock of wood specimens for exchange purposes. About 55 woods were collected along with herbarium vaucher specimens from North Gonda, Forest Division.

Identification of about 14 erroneous woods was not got confirmed from Cenozoic Lab. carpenter was engaged to cut and plain the wood blocks and in all 134 samples were sent to the following parties from whom woods had already been received by us on exchange.

1. Chief of the Division, 20 wood samples
   Centre Technique Forestier
   Tropical, 45 bis avenue dela-Belle,
   Gabrielle, Nogeut Sur Marne
   (Seine) FRANCE.

2. The Curator, 30 ,,
   U. S. National Museum, Smithsonion
   Institute, Washington 25 D. C.,
   U. S. A.

3. The Incharge, 20 ,,
   Wood Identification Research
   Division, Forest Product Lab.,
   Madison-5, Wisconsin, U. S. A.

4.	The Curator. F. P. R. L., Princess Rishorrough, Aylesbury, Bucks. England.	22 wood samples
5.	The Wood Anatomist, Musee Royal de' Afrique, Central, Tervuren, Belgium.	21 ,,
6.	The Director, National Science Development Board, F. P. R. I. Development Commission College, Laguna, Phillipine.	21 ,,

185 wood slides have been submitted by the Cenozoic Palaeobotany Department, which have properly been indexed, catalogued and incorporated.

Quaternary Palynology Department has passed on to the Herbarium 776 seed specimens brought by Dr. Vishnu-Mittre and party from the germ plasm collection of I. A. R. I New Delhi.

Plant specimens of the genus *Paederia* were received on loan from B. S. I., Eastern Circle, Shillong for confirmation and study of our specimens. 12 fern specimens were lent to the National Botanic Gardens, Lucknow for their research purpose A set of 50 herbarium specimens was sent to the Systematic Botany Branch, F. R. I., Dehra Dun on exchange. A set of 32 plant specimens of Himachal Pradesh was received from B. S. I. Northern Circle, Dehra Dun on exchange basis.

An stress was laid to develop the phyllothek. About 10 cleared leaf specimens have been prepared. 19 specimens

received from Systematic Botany Branch, F. R. I., Dehra Dun were added to the Phyllotheck collection after indexing and cataloguing. The work is in progress.

A packet of 12 seed samples was sent in exchange to Laboratory de Botanique, Grenoble, France on their request. They were requested to send few samples of seeds of their country.

Routine work of poisoning, mounting, labelling and repairing remained continued.

Curator Herbarium was invited to attend the 1st Indian Palynological Congress held at Chandigarh and was nominated member of the Bibliographical Committee of Indian Palynology. His paper "The Thalamiflorae—An Analysis of Pollen Morphology, with reference to Taxonomy and Evolution" has been accepted for publication in New Botanist.

Partner Power Chain Saw has been procured to hasten the collection of woods and to have representation of all woods of our country in the Xylarium. Mechanic from the firm which supplied the Power Chain Saw was engaged to impart training to the Herbarium staff as well as other interested members of the Institute. A short trip to the L. I. T. forest of Avadh Forest Division was organized to give field demonstration of cutting and felling of trees. Scientist Incharge N. B. G., Lucknow very kindly allowed to make collection of woods from their rare collection of plants About 20 specimens from the dried stumps or the branches were collected from there.

XVI. BUILDING

Due to recent orders of Government of India on economy measures, maintenance expenditure on Building was kept to the nearest minimum and no major construction was taken up during the year.

XVII. VISITORS

DISTINGUISHED PERSONS

Shri P. R. V. Bhiman, I. A. S.
Administrator,
Kanpur Corporation, Kanpur.

Shri F. Mojah
Department of Geology, College of Arts &
Science, Pahlavi University, Shiroz, Iran.

Shri V. S Chettri,
Senior Geologist, Nepal Geological Survey,
Kathmandu, Nepal.

Shri A. T. M F. Haque
Deparment of Geology, University of Dacca,
Bangladesh.

Dr. S. M. Sherfuddin, I. A. S., T. T.,
Dona, Bangladesh

Prof. & Mrs. T. A. Davis,
Indian Statistical Institute,
Calcutta.

Professor M. R. Sahni,
Retd. Professor of Geology,
Punjab University, Chandigarh.

Prof. C. V. Subramanian,
Director,
Centre for advanced Studies, University Botany
Laboratory, Madras.

Shri A. K. Mustafy,
Vice-Chancellor,
Lucknow University, Lucknow.

Dr. T. N. Khoshoo,
Director-in-charge,
National Botanic Gardens,
Lucknow.

Dr. D. Lal,
Director,
Physical Research Laboratory,
Ahmedabad.

Dr. Nitya Nand,
Director,
Central Drug Research Institute,
Lucknow.

Professor H. D. Sankalia,
Emeritus Professor, Deccan College,
Poona.

Swami Chimmayanand Ji Maharaj

Dr. Y. Nayudamma
Secretary to the Govt. of India
& Director-General, Council of
Scientific & Industrial Research,
New Delhi.

Shri W. I. Mouins,
54, Munro Building, Toronto,
Canada.

Dr. H. Fajfe,
University of Vienna
Austria.

Ven D. Somoratana & Col. Rajapahare,
131/2, Lake Road, Moharogama,
Sri Lanka.

XVIII. THE GOVERNING BODY, FINANCE & BUILDING COMMITTEE AND SCIENTIFIC PROGRAMME & EVALUATION COMMITTEE

1. The Governing Body

CHAIRMAN

Professor T. S. Sadasivan,
"Gokulam", 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,
Head of the Botany Department,
University of Allahabad,
Allahabad.

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

Professor Uma Shanker Srivastava,
Professor or Zoology, University of Allahabad,
Allahabad.

Professor A. R. Rao,
No. 2, XI Main Road, 3rd Block, East Jayanagar,
Bangalore–11.

Shri M N. Venkataraman,
Deputy Financial Adviser (Science & Technology),
Technology Bhavan, New Mehrauli Road,
New Delhi.

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

Professor T. S. Mahabale,
Maharashtra Association for the Cultivation of
Sciences, Law College Road,
Poona.

Director-General,
Archaeological Survey of India,
New Delhi.

Shri A. B. Das Gupta,
Managing Director,
Oil India Ltd., 17 Parliament Street,
New Delhi–110001.

Vice-Chancellor,
Lucknow University,
Lucknow.

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

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

2. **Finance and Building Committee**

CHAIRMAN

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

MEMBERS

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

Shri M. K Venkataraman,
Deputy Financial Adviser (Science & Technology)
Technology Bhavan, New Mehrauli Road,
New Delhi.

Chief Engineer, or his Nominee
State P. W. D., U P.,
Lucknow.

Representative,
Department of Science & Technology,
New Delhi.

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

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

3. Scientific Programming and Evaluation Committee

CHAIRMAN

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

MEMBERS

Professor A. R. Rao,
No. 2, XI Main Road, 3rd Block, East Jayanagar,
Banglore-11.

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

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

Dr. R. N. Lakhanpal,
Head of the Cenozoic Palaeobotany Department,
Birbal Sahni Institute of Palaeobotany,
Lucknow.

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

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

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

Dr. S. C. D. Sah,
Head of the Oil Palynology Department,
Birbal Sahni Institute of Palaeobotany,
Lucknow.

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

XIX. 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., (Assistant Director till 12.12.74 and
Deputy Director since 13.12.1974).

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.
Dr (Mrs.) Rehana Makada, M. Sc., Ph. D. (Resigned
on 3 8.1974)
Shri A. K. Srivastava, M. Sc.
Shri Manoj Shukla, M. Sc.
Miss Reshma Bijlani, M. Sc. (Research Scholar)

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 Banerjee, M. Sc.
Shri K P. Navneeth Kumaran, M. Sc.
Miss Zeba Bano, M. Sc.
Shri B. N. Jana M. Sc. (Research Scholar joined on 15.11.74)

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. (Research Scholar)

DEPARTMENT OF COAL PALAEOBOTANY

Dr. D. C. Bharadwaj, M. Sc., Ph. D. (Lucknow) Head
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. Anand-Prakash, M. Sc., Ph. D.
Dr. Pramod Kumar, M. Sc., Ph. D.
Shri B. K. Misra, M. Sc.
Miss Archana Dwivedi, M. Sc.
Miss Vijaya Rana, M. Sc. (Research Scholar)

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. (Mrs.) Chhaya Sharma, M. Sc., Ph. D.
Miss Asha Khandelwal, M. Sc.
Miss R. Savithri, M. Sc.
Mr. Awadesh Kumar Saxena (Research Scholar since 7.11.1974).

DEPARTMENT OF OIL PALYNOLOGY

Dr. S. C. D. Sah, M. Sc., Ph. D. Head
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 (Research Scholar since 7.11.74)

GEOLOGY SECTION

Shri S. K. Kulshreshtha, M. Sc.
Shri N. C. Mehrotra, M. Sc.

C-14 LABORATORY

Dr. G. Rajagopalan Head
Shri G. Jain

PUBLICATION

Shri N. N. Moitra, B. A. (Assistant Editor)

LIBRARY

Shri J. N. Nigam, B. A., B. Lib. Sc. (Librarian)
Shri S. N. Joshi, B. Sc., B. Lib. Sc. (Library Assistant)

MUSEUM

Dr. Anil Chandra, M. Sc., Ph. D. (Curator)

Shri Mohan Shanker, B. Sc. (Museum Assistant — Resigned on 27.8.74)
Shri N. C. Saxena, B. A. (Offg. 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)
Shri R. S. Ojha (Plant Collector)

LABORATORY SERVICES

Miss Asha Bharadwaj, B. Sc. (J. T. A.)
Miss Madhavi Chowdhury, B.Sc. ,,
Miss Indra Kumari, B. Sc. ,,
Shri H. N. Boral, B. Sc. ,,
Shri D. C. Joshi ,,
Shri B. Sekar, B. Sc. ,,
Miss Kamla Amarlal, B. Sc. ,, (Scheme "Palynological studies from Oil India Ltd. till 31.12.1974 and J. T. A. in Quaternary Palynology Department since 1.1.1975).
Miss Sona Rani, B.Sc. ,, since 1.1.1975 in the Scheme "Palynological studies from Oil India Ltd.
Shri N. K. Khasnavis, B. Sc. (Laboratory Assistant)
Shri Vijay Singh Panwar (Glass Blower)

PHOTOGRAPHY & DRAWING

Shri S. S. Rana (Artist)

Shri P. C. Roy (Photographer)

STORE

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 B. Singh (U. D. C.)
Shri I. J. S. Bedi (Steno-typist)
Shri Ramesh Chandra (L. D. C.)
Shri R. K. Kapoor (L. D. C.)
Shri K. Devrajan (L. D. C.)

BALANCE SHEET AS

LIABILITIES		Rs.	Rs.
Capital Funds			
As per 31st March, 1974		24,27,039·23	
Govt. of India grants on Capital Account during the year		4,42,500·00	
Recurring Grant used for Capital formation			
Library Books & Journals	13,399·14		
Maps & Toposheets	47·15	13,446·29	28,82,985·52
Add Excess of Revenue grants over Revenue Expenditure			
Add Funds provided by other organisations for Capital formations :			
M. G. T. Schemes (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	29,62,992·09

PALAEOBOTANY, LUCKNOW

ON 31st MARCH, 1975

ASSETS		Rs.	Rs.
Land Donated By U. P. Government			32,292·00
Works and Buildings			
As per 31st March, 1974		11,04,031·76	
During the year	3,013·58		
	2,600·00	5,613·58	11,09,645·34
Apparatus & Equipments			
(A) Apparatus & Equipments			
As per 31st March, 1974		5,71,870·98	
During the year	8,310·05		
	1,887·20		
	14,882·60	25,079·85	5,96,950·83
(B) Workshop Equipments			
As per 31st March, 1974		62,213·95	62,213·95
(C) Office & Miscellaneous Equipments			
As per 31st March 1974		46,278·37	46,278·37
(D) Plant & Machinery			
As per 31st March, 1974		81,196·63	
During the year		4,274·77	
Establishment of C–14 Lab.	94,554·06		
	2,15,330·34		
	7,347·31		
	2·43	3,17,234·14	4,02,705·54
		Total C/o	22,50,086·03

LIABILITIES	Rs.	Rs.
Total B/F		29,62,992·09
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		9,13,693·83
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	7,074.00	
P. K. Srivastava Memorial Fund	2,300·00	
Other Donations	7,262·65	
Dorothy Walton	352·70	22,785·23
Founders Donation Account		1,52,500·00
Burmah Oil Company		1,900·00
Deposits Accounts		5,541·78
Value of Priced Publications		3,27,013·37
As per Contra		141·00
Loans and Advances		27,296·00
Total C/o		45,40,785·05

ASSETS	Rs.	Rs.
Total B/F		22,50,086·03
Apparatus & Equipments (Donated)		
M. G. T. Scheme	7,155·79	
Burmah Oil Company	700·00	
Founders Donation	2,500·00	
Coal Scheme	6,645·29	
Palynology Scheme	5,207·87	
Rajasthan Scheme	21,138·90	43,347·85
UNESCO Aid Equipment	19,629·75	19,629·75
Humboldt Foundation W. Germany (Gift of Microscope)	75,091·50	75,091·50
Vehicles	56,433·65	56,433·65
Furniture and Fixtures		
As per 31st March, 1974	3,21,077·70	
During the year	19,978·87	3,41,056·57
Furniture 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 & Journals		
As per 31st March, 1974	33,742·92	
During the year	25,167·15	
Founders Library Donated	50,000·00	1,08,910·07
Total C/o		28,98,819·49

LIABILITIES	Rs.		Rs.
	Total	B/F	45,40,785·05
	Total	C/o	45,40,785·05

ASSETS	Rs.	Rs.
	Total B/F	28,98,819·49
Maps & Toposheets		
As per 31st March, 1974	6,503·76	
During the year	47·15	6,550·91
Founders Fossils Collections (Donation)		50,000.00
Donation Account		
Investments		17,500.00
General Provident Fund		
Investments	5,54,560.93	
Advances out of G. P. F.	60,975.00	
Insurance Policies Subscribed out of G.P.F. to the extent of	34,556.00	6,50,091.93
Priced Publications in Stock		
"The Palaeobotanist" Volume 1–21	1,41,228.37	
Symposium	76,285.00	
Autumn School Proceedings	43,400.00	
"Monograph"	43,700.00	
"Seward Memorial Lectures"	19,816.00	
"Birbal Sahni Memorial Lecture"	860.00	
"Silver Jubilee Lecture"	1,724.00	3,27,013.37
"Picture Post Cards"		141.00
Loans and Advances		
Festival Advance	2,980.00	
Conveyance Advance	24,316.00	27,296.00
	Total C/o	39,77,412·70

LIABILITIES	Rs.		Rs.
	Total	B/F	45,40,785 05
		Total	45,40,785·05

Sd/–Ghanshyam Singh
Accounts Officer
Birbal Sahni Institute of Palaeobotany,
Lucknow.

Sd/–S. M. Singh
Section Officer
Office of A.G U.P.
Camp at .....

ASSETS	Rs.	Rs.
	Total B/F	39,77,412·70
Sundry Debtors		
For unsettled advances (C/R) Account	26,702.00	
For unsettled advances (C. N. R.)	2,893.00	29,595.00
UNESCO Book Coupons		982.94
Cash Balances		
At Bank		
Current Account at S B. I. Lucknow	1,32,509.89	
Savings Bank Account at S. B. I. Lucknow	2,63,601.90	3,96,111.79
In Hand		
Cash in hand (C.R.) Account	108.21	
Cash in hand (Oil India Scheme)	16.16	124.37
Excess of Revenue Expenditure Over Revenue Income		1,36,558.25
	Total	45,40,785.05

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.

INCOME & EXPENDITURE ACCOUNT FOR THE

EXPENDITURE	PLAN	NON-PLAN	TOTAL
Academic Expenses			
To Pay & Allowances of Academic Staff	7,014·52	6,06,854·28	6,13,868·80
To Field Excursion	31,354·93	448·85	31,803·78
To Refresher Course Expenses			
To Honorarium to Lecturers :			
(i) Birbal Sahni Memorial Lecture		350 00	350 00
(ii) Silver Jubilee Memorial Lecture		350·00	350·00
To Training of Academic Staff at G.S.I. Camp		150·00	150·00
To International Programmes : Deputations Abroad		15,266·50	15,266·50
To Series of Extension Lectures			
To Honorarium to Foreign Visiting Scientist			
To Presentation of Medals			
Expenses on Services Ancilliary to Research			
To Pay & Allowances of Auxiliary Tech. Staff		1,95,850·25	1,95,850·25
Total C/o Rs.	38,369·45	8,19,269·88	8,57,639·33

PALAEOBOTANY, LUCKNOW

YEAR ENDING 31st MARCH, 1975

INCOME	PLAN	NON-PLAN	TOTAL
Balance of Last Year's Grant on Revenue A/C Allowed for Expenditure During Current Year, Silver Jubilee and Oil India Grant Account	150·00	1,97,829·39	1,97,979·39
By Grants from Govt. of India on Revenue Account	1,87,500·00	8,73,000·00	10,60,500·00
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.		15,000·00	15,000·00
(ii) Subventions from Universities and U.G.C. for Silver Jubilee Celebrations			
Total C/o Rs.	1,87,650·00	10,90,829·39	12,78,479·39

EXPENDITURE	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	38,369·45	8,19,269·88	8,57,639·33
To Chemicals & Glasswares, Photogoods & Small Apparatus etc.	33,611·36	17,924·27	51,535·63
To Library Requirements		15,647·95	15,647·95
To Museum Requirements	2,642·28	763·09	3,405·37
To Herbarium Requirements	1,181·69	303·53	1,485·22
To Maintenance of Equip., Appa. & Workshop Machinery	509·44		509·44
To Publication Expenses			
"The Palaeobotanist"		29,794·81	29,794·81
Symposium Monograph			
Birbal Sahni Memorial Lecture		467·51	467·51
Silver Jubilee Memorial Lecture		209·00	209·00
Seward Memorial Lecture		435·60	435·60
Annual Report		1,797·00	1,797·00
To Travelling and other Allowances			
For Governing Body, Scientific Programmes, and Evaluation Committee and Selection Committee meetings	2,280·42	4,429·85	6,710·27
Total C/o Rs.	78,594·64	8,91,042·49	9,69,637·13

INCOME	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	1,87,650·00	10,90,829·39	12,78,479·39
By Sale Proceeds of Publications			
(i) The Palaeobotanist		43,108·06	43,108·06
(ii) Monographs		50·00	50.00
(iii) Symposium		2,099·54	2,099·54
(iv) Seward Memorial Lecture		132·31	132·31
(v) Picture Post Cards		238·00	238·00
By Other Income			
(i) By Vehicle Charges		300·43	300·43
(ii) By Telephone Charges		900·30	900·30
(iii) By Visiting Scientist Room Charges		170·00	170·00
By Miscellaneous Receipts and Recoveries			
Miscellaneous Receipts & Recoveries		2,283·23	2,283·23
Recoveries of Flood Advance		666·00	666·00
Recoveries of Conveyance Advance	150.00	23,282·00	23,432·00
Recoveries of Festival Advance		3,820·00	3,820·00
Receipts from Contractors			
Interest on Advances		352·13	352·13
Total C/o Rs.	1,87,800·00	11,68,231·39	13,56,031·39

EXPENDITURE	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	78,594·64	8,91,042·49	9,69,637·13
For attending Scientific meetings and Conferences in India and for other purposes.	1,923·86	5,435·14	7,359·00
For Reimbursement of Medical Expenses		32,618·69	32,618·69
To Over Time Allowance		1,463·50	1,463·50
To Leave Travel Concession		2,761·25	2,761·25
To Honorarium to Secretary to Chairman			
To Reimbursement of Tution Fees		675·25	675·25
To Child Education Allowance		843·00	843·00
To Pensionary Expenses			
To Supernuation Allowance and Pension		18,090·77	18,090·77
To General Expenses			
To Pay & Allowance of Administrative Staff		2,71,251·93	2,71,251·93
To Telephone & Trunk Call Charges		11,065·50	11,065·50
To Postage		8,000·30	8,000·30
Total C/o Rs.	80,518·50	12,43,247·82	13,23,766·32

INCOME		PLAN	NON-PLAN	TOTAL
Total B/F	Rs.	1,87,800.00	11,68,231.39	13,56,031.39
Total	Rs.	1.87,800.00	11,68,231.39	13,56,031.39

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

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

EXPENDITURE	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	80,518·50	12,43,247·82	13,23,766·32
To Advertisement Charges	5,224.01	3,931·49	9,155·50
To Hot and Cold Weather Charges	55·00	2,082·85	2,137·85
To Petrol & Mobil Oil	1,062·98	2,579·23	3,642·21
To Electricity Charges	8,573·06	3,035·19	11,608·25
To Municipal Taxes		5,027·16	5,027·16
To Insurance of Vehicle & Library		367·80	367·80
To Uniform to Class IVth Staff	1,340·96	2,419·04	3,760·00
To Printing & Stationary	15,727·11	8,988·50	24,715·61
To Customs Duty & Port Trust Charges			
To Railway Ft. and Carriage		1,568·80	1,568·80
ToEntertainment Allowance to Director		1,138·27	1,138·27
To Miscellaneous & Unforeseen	20,030·80	5,621·09	25,651·89
To Leave Salary		36,272·36	36,272·36
Total C/o Rs.	1,32,532·42	13,16,279·60	14,48,812·02

INCOME	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	1,87,800·00	11,68,231·39	13,56,031·39
Total C/o Rs.	1,87,800·00	11,68,231·39	13,56,031·39

EXPENDITURE	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	1,32,532·42	13,16,279·60	14,48,812·02
To Maintenance Expenses			
To Building		2,955·55	2,955.55
To Garden		1,531·96	1,531·96
To Vehicle	4,896·13	713·29	5,609·42
To Repairs & Renewals		4,188·24	4,188·24
To Petty Constructions			
To Other Expenses			
To Contribution to Provident Fund			
To Legal Advice			
To Medical Advice			
To Festival Advance		3,300·00	3,300·00
To Flood Relief Advance			
To Conveyance Advance			
To Oil India Expenses			
To Pay & Allowances		8,049·52	8,049·52
To T. A. Expenses		845·22	845·22
To Contingencies		567·04	567·04
To Silver Jubilee Expenses			
To Silver Jubilee Publications			
To Govt. of India Scholarship Expenses		14,165·74	14,165·74
To Last Year's Excess Expenditure			
Central Recurring Grant Account	2,090·07		2,090·07
Total C/o Rs.	1,39,518·62	13,52,596·16	14,92,114·78

INCOME	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	1,87,800·00	11,68,231·39	13,56,031·39
Total C/o Rs.	1,87,800·00	11,68,231·39	13,56,031·39

EXPENDITURE	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	1,39,518·62	13,52,596·16	14,92,114·78
Govt. of India Res. Scholarship Grant Account			
To Expenditure on Transfer to C. N. R. Account			
To Expenditure on Miscellaneous Receipts		474·86	474·86
	1,39,518·62	13,53,071·02	14,92,589·64
EXCESS OF EXPENDITURE OVER INCOME	(+) 48,281·38	(—) 1,36,558.25	
		(—) 1,84,839·63	
Total Rs.	1,87,800·00	11,68,231·39	13,56,031·39

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

Sd/-S.M. Singh
Section Officer
Office of A.G.
U.P. Camp
at .....

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

INCOME		PLAN	NON-PLAN	TOTAL
Total B/F	Rs.	1,87,800·00	11,68,231·39	13,56,031·39
Total	Rs.	1,87,800·00	11,68,231·39	13,56,031·39

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

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

BIRBAL SAHNI INSTITUTE OF

RECEIPT & PAYMENT ACCOUNT FOR

RECEIPTS	PLAN	NON-PLAN	TOTAL
To Opening Balance			
Bank Account (Misc.)	1,28,063·54	1,75,481·63	3,03,545·17
Cash Account	150·00	273·74	423·74
Oil India Account			
Bank Account		2,422·40	2,422·40
Cash Account		16·16	16·16
Donation Account			
Bank Account		5,467·73	5,467·73
Silver Jubilee Account			
Bank Account		19,635·46	19,635·46
Amount spent out of balance now recouped			
Refund of Excursion Advance			
Proceeds of Cancelled cheque			
To Govt. of India Grants (Cap. A/c)	4,4 ,500·00		4,42,500·00
To Govt. of India Grants (Rev. A/c)	1,87,500·00	8,73,000·00	10,60,500·00
To Govt. of India Grants (S. J. A/c)			
To Govt. of India Res. Schol. Grants			
To Govt. of U. P. Research Grant		5,000·00	5,000·00
Total C/o Rs.	7,58,213·54	10,81,297·12	18,39,510.66

PALAEOBOTANY, LUCKNOW

THE PERIOD 1.4..974 to 31.3.1975

PAYMENTS	PLAN	NON-PLAN	TOTAL
By Opening Balance	2,090·07	00·25	2,090·32
By Work & Building	5,613·58		5,613·58
By Research Apparatus & Equipment			
By Equipment for Services	8,310·05		8,310·05
Ancillary to Research.			
Photography Section	1,887 20		1,887·20
Library			
Museum			
Herbarium	4,274·77		4,274·77
Workshop Maceration			
Auditorium and Lab			
Stores			
Visiting Scientist Room			
Garden Equipment			
Office & Miscellaneous Equipment			
C–14 Laboratory	2,18,148·34		2,18,148·34
By Furniture & Fixtures	19,978 87		19,978·87
By Vehicles			
By Refund of Grants to Government			
Capital Grants			
Total C/o Rs.	2,60,302·88	00·25	2,60,303·13

RECEIPTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	7,58,233·54	10,81,297·12	18,39,510·66
To Grants from other organisations Silver Jubilee Oil India		15,000·00	15,000·00
To Sale Proceeds of Publications			
The Palaeobotanist		43,108·06	43,108·06
Monograph		50·00	50·00
Symposium		2,099·54	2,099·54
Seward Memorial Lecture		132·31	132·31
Picture Post Cards		238·00	238·00
To Administrative Receipts			
Income Tax	490·00	30,845·00	31,335·00
Insurance Premium (S. S. Scheme)	216·39	31,429·79	31.646·18
C. T. D. (Post Office)		3,980·00	3,980·00
Vehicle Charges		300·43	300·43
Telephone Charges		900.30	900·30
V. S. Room Charges		170·00	170·00
Recovery of Adv. Int. Under G. P. F.		62,599·00	62,599·00
G. P. F. Subscription	549·00	81,739·10	82,288·10
Excess Subscription of G.P.F. C.D.S. (Additional D.A.)	163·00	39,184·00	39,347·00
Miscellaneous Receipt & Recoveries		2,283·23	2,283·23
Total C/o Rs.	7,59,631·93	13,95,355·88	21,54,987·81

PAYMENTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	2,60,302·88	00·25	2,60,303.13
Revenue Grants			
Silver Jubilee Grants			
By Pay and Allowances			
Pay (Academic)	5,714·52	4,14,405·84	4,20,120·36
Pay (Auxiliary Technical)		1,17,176·85	1,17,176·85
Pay (Administrative)		1,63,629·79	1,63,629·79
Leave Salary		36,272·36	36,272·36
Dearness Pay		32,808·78	32,808·78
Dearness Allowance	1,150·00	2,06,768·98	2,07,918·98
House Rent Allowance		86,985·92	86,985·92
City Compensatory Allowance	150·00	32,892·54	33,042·54
Interim Relief		19,287·76	19,287·76
Children Educational Allowance		843·00	843·00
Over Time Allowance		1,463·50	1,463·50
Reimbursement of Medical Expenses		32,618·69	32,618·69
Reimbursement of Tuition Fees		675·25	675·25
Leave Travel Concession		2,896·25	2,896·25
Hon. to Secty. to Chairman			
By Travelling Allowances			
For Governing Body & Selection Committee Meetings	2,280·42	4,429·85	6,710·27
Total C/o Rs.	2,69,597·82	11,53,155·61	14,22,753·43

RECEIPTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	7,59,631·93	13,95,355·88	21,54,987·81
To Loans and Advances			
Recoveries of Flood Rel. Advance		666·00	666·00
Recovery of Festival Advance		3,820·00	3,820·00
Recovery of Conveyance Advance	150·00	23,282·00	23,432·00
Interest on Conveyance Advance		352·13	352·13
To Deposits			
Security Deposits By Transfer to Building Advance	3,013·58		3,013·58
Miscellaneous Deposits			
Donations & Endowments			
Donation			
Proceeds of Matured Securities			
Interest		167·50	167·50
Total C/o Rs.	7,62,795·51	14,23,643·51	21,86,439·02

PAYMENTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	2,69,597·82	11,53,155·61	14,22,753·43
For attending meetings & Conferences in India & for other purposes.	2,373·86	5,435·14	7,809·00
By Maintenance of Property			
For Building		3,287·55	3,287·55
For Garden		1,531·96	1,531·96
For Equipment and Apparatus	509·44		509·44
For Vehicles	4,896·13	713·29	5,609·42
For Repairs and Renewals		4,188·24	4,188·24
For Petty Constructions			
By Contingencies			
For Telephone & Trunk Call Charges		11,065·50	11,065·50
For Postage		8,000·30	8,000·30
For Advertisement	5,224·01	3,931·49	9,155·50
For Hot & Cold Weather Charges	55·00	2,082·85	2,137·85
For Petrol & Mobil Oil	1,062·98	2,579·23	3,642·21
For Electricity Charges	8,573·06	3,035·19	11,608 25
For Municipal Taxes		5,027·16	5,027·16
For Insu. of Vehicle & Library		367·80	367·80
For Liveries to Subordinate Staff	1,340·96	2,419.04	3,760·00
Total C/o Rs.	2,93,633·26	11,96,820·35	14,90,453·61

RECEIPTS		PLAN	NON-PLAN	TOTAL
Total B/F	Rs.	7,62,795·51	14,23,643·51	21,86,439·02
Total C/o	Rs.	7,62,795·51	14,23,643·51	21,86,439·02

PAYMENTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	2,93,623·26	11,96,820·35	14,90,443·61
For Printing & Stationery	15,727·11	8,980·50	24,715·61
For Custom Duty & Port Trust Charges		500·00	500·00
For Railway Ft. & Carriage		1,613·80	1,613·80
For Entertainment All. to Director		1,438·27	1,438·27
For Miscellaneous & Unforeseen	20,030·80	5,621·09	25,651·89
For Glassware & Chemicals etc.	33,611·36	17,924·27	51,535·63
For Library requirements	11,768·01	15,822·95	27,590·96
For Museum Requirements	2,892·28	763·09	3,655·37
For Herbarium Requirements	3,431·69	303·53	3,735·22
For Legal Advice			
For Medical Advice			
By Publications			
For the Palaeobotanist		29,794·81	29,794·81
For Symposium			
For Monograph			
For Seward Memorial Lecture		435·60	435·60
Total C/o Rs.	3,81,084·51	12,80,018·26	16,61,102·77

RECEIPTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	7,62,795·51	14,23,643·51	21,86,439·02
Total C/o Rs.	7,62,795·51	14,23,643·51	21,86,439·02

PAYMENTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	3,81,084·51	12,80,018·26	16,61,102·77
For Annual Report		1,797·00	1,797·00
For Birbal Sahni Memorial Lecture			
For Silver Jubilee Memorial Lecture			
By Academic Expenses			
For Field Excursion	53,694·93	448·85	54,143·78
For Refresher Course Expenses			
For Honorarium to Lectures			
Birbal Sahni Memorial Lecture		817·51	817·51
Silver Jubilee Memorial Lecture		559·00	559·00
Sir A. C. Seward Memorial Lecture out of Donation Account		350·00	350·00
For Training of Academic Staff at C. S. I. Camp.		150·00	150·00
By International Programmes			
Air passage for members of Staff proceeding on foreign fellowships or invited to attend Scientific meetings and Conferences abroad.		15,266·50	15,266·50
Total C/o Rs.	4,34,779·44	12,99,407·12	17,34,186·56

RECEIPTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	7,62,795·51	14,23,643·51	21,86,439·02
Total C/o Rs.	7,62,795·51	14,23,643·51	21,86,439·02

PAYMENTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	4,34,779·44	12,99,407·12	17,34,186·56
International Culture Exchange Programmes			
Honorarium to foreign Visiting Scientist			
By Silver Jubilee Celebration			
Silver Jubilee Publications			
By G. P. F. Account			
Contribution towards G. P. F.			
G.P.F. Subs. transferred to G. P F. A/c	549·00	81,739 10	82,288·00
Recovery of advances & interest thereon transferred to G. P. F. Account		62,599·00	62,599·00
By Miscellaneous			
Income Tax Remitted	490·00	30,845·00	31,646·18
Insurance Premium Remitted	216·39	31,429·79	31,335·00
C.D.S. (Add. D.A.) Remitted	163·00	39,184·00	39,347·00
C.T.D. Amount Remitted	—	3,980·00	3,980·00
C.D.S. (Wages Account) Remitted	—	—	—
By Government of India Scholarship		14,165.49	14,165.49
By Loans and Advances			
Flood Relief	—	—	—
Festival Advance	—	3,300·00	3,300·00
Total C/o Rs.	4,36,197·83	15,66,649·50	20,02,847·33

RECEIPTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	7,62,795·51	14,23,643·51	21,86,439·02
Total Rs.	7,62,795·51	14,23,643·51	21,86,439·02

	Closing Balance			
	Bank		Cash	
	Recurring	Non-Recurring	Recurring	Non-Recurring
Plan	22,991·33	2,90,684·28	—	—
Non-Plan				
Central				
Recurring (–)	2,14,047·08	—	108·21	
Oil India	7,960·62	—	16·16	
Silver Jubilee	19,635·46			
Donation &	5,285·23			
Endowment(+)				
	32,881·31		124·37	
		(–) 2,14,047·08		
		32,881·31		
		1,81,165·77		
	Cash in Hand :	124·37		
		1,81,041·40		

PAYMENTS	PLAN	NON-PLAN	TOTAL
Total B/F Rs.	4,36,197·83	15,66,649·50	20,02,847·33
Conveyance Advance	—	—	—
By Oil India Expenses		9,461·78	9,461·78
By Expenditure out of Misc. Receipts		474·86	474·86
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		18,090·77	18,090·77
By Refund out of Deposits			
To Modern Construction	11,836·98	—	11,836·98
To Rajiv & Co.	1,075·04	—	1,075·04
By Closing Balance	3,13,675·66	(–)1,81,041·40	1,32,634·26
Total Rs.	7,62,795·51	14,23,643·51	21,86,439·02

Sd/-Ghanshyam Singh
Accounts Officer
Birbal Sahni Institute
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