

COUNCIL OF SCIENTIFIC AND  
INDUSTRIAL RESEARCH  
(INDIA)

A REVIEW

by

*Director, Scientific & Industrial Research*



January 1948.

**CAMBRIDGE PRINTING WORKS,**  
**DELHI.**

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# APPENDICES

## APPENDIX I (A)

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## APPENDIX II.

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Superintendent.	Mr. Nandihal Singh.

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Director	Sir K. S. Krishnan, F. R. S.
Assistant Director (Planning)	Dr. K. N. Mathur, D. Sc. F. Inst. P.
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Assistant Secretary.	Mr. Gurdev Saran.

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Assistant Director (Planning)	Dr. A. Lahiri.
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<b>(Engineering)</b>	<b>Mr. S. Rama Chandra Rao.</b>

## APPENDIX III (A)

**Processes evolved under the auspices of the Council of  
Scientific & Industrial Research.**

1. High tension ignition cable testing device for field use.
2. Patching cement for repairing rubber and synthetic rubber tanks.
3. Slushing varnishes for metal tanks for petrol storage, and for rubber, synthetic rubber and laminated tanks for carrying petrol in aircraft.
- \*4. Nimbidin, nimbidin emulsion and nimbidin gargle.
- \*5. Petrol tank sealing composition.
6. Smoke candles and distress signals for use in land and aerial operations.
- \*7. Petrol pump diaphragms proof against petrol, alcohol and their mixtures.
- \*8. Non-inflammable water resistant cloth.
9. Furfural.
10. Substitute hairlock.
- \*11. Collapsible tubes.
- \*12. Lubricants from vegetable oils and vegetable oil mineral oil blends.
13. Carbon electrodes for dry cells, arc lamps and arc welding.
14. Reclamation and use of perspex.
- \*15. Tin lining and seaming compound.
16. Improved hot food containers.
17. Antigas cloth.
18. Vegetable oils as fuels and lubricants.
- \*19. Laminated paper boards.
- \*20. Air foam solution.
- \*21. Bhilawan stoving enamel and allied products.
22. Luminous paints and pigments.
23. Substitutes for glass.
24. Silver and glossy transparent paper.
25. Solid fuel.
26. Oil silks.
- \*27. Jute boards.
28. Water proof paint for indianite roofing slabs.
- \*29. Cork substitutes.
30. Sulphur.
31. Identity discs.

- ♦32. Treatment of manganese ores for use in dry cell manufacture.
- 33. Stearic and oleic acids.
- 34. Barium chloride.
- 35. Potassium chlorate.
- 36. Dettol type of disinfectants.
- 37. Dye extracts and dyed shades on wool and cotton from the barks of *Terminallia arjuna* and *Butea frondosa*.
- 38. Dye extracts and dyed shades on wool from tamarind seed testa.
- 39. Extracts of annatto dye for colouring vegetable ghee, milk, ice cream, aerated waters and food products in general.
- ♦40. Indigenous moulding powders-S.H.P.
- 41. Vacuum pumps.
- ♦42. Treatment of jute mill bobbins by resin impregnation.
- 43. Atoxyl and carbarsonne.
- 44. Glandular products.
- 45. Potash salts from molasses.
- 46. Calcium gluconate.
- ♦47. Small carbon electrodes.
- 48. Carbon and graphite electrodes.
- ♦49. Benzidine.
- ♦50. Para-amino phenol.
- 51. Radio resistances.
- ♦52. Drawn laminated mouldings.
- 53. "Beemax" like products.
- 54. Yeast extracts.
- ♦55. Welding flux for aluminium and its alloys.
- 56. Photosensitising dyestuffs.
- 57. Photographic plates and paper.
- 58. Porcelain containers for hydrogen peroxide
- ♦59. Water detecting composition.
- ♦60. Duplicating ink.
- 61. Organo-arsenical compounds.
- 62. Titanium dioxide from ilmenite.
- 63. Mosquito repellent cream.
- ♦64. Bhilawan air drying varnishes etc.
- 65. Total alkaloids from *datura* seeds.
- 66. Flux coated steel electrodes.
- ♦67. Ebonite substitute and other hard and soft rubber goods from rubber waste.



68. Shark liver oil.
69. Fertilizers from phosphatic nodules.
70. Phosphorus from phosphatic nodules.
71. Treatment of bamboo reeds for use on handlooms.
72. Water proofing compound for cement mortars.
- \*73. Butter paper.
74. Coffee bean and husk plastics.
75. Substitute for gramophone metallic needles.
- \*76. Urea.
- \*77. Hydraulic brake fluid.
78. Nitrobenzene, aniline and dimethylaniline.
79. Formaldehyde.
80. Solid metal polish.
81. Petrol hose pipes.
82. Zinc salts from waste zinc slimes.
83. Pyrethrum emulsifier.
84. Aniline from chlorobenzene.
85. Clay pigeons.
- \*86. Sintered glassware.
87. Compression and injection moulding powders from bhilawan shell liquid.
88. Bonding of plywood from indigeneous raw materials.
89. Carbon microphones.
90. Loud speakers.
91. Rubber sponges.
92. Manufacture of straw boards from various grasses.
93. Copper silicon bronze.
94. X-Ray transformers.
95. Concentrated extracts of pyrethrum.
96. Manufacture of enterovioform.
97. Manufacture of butanol and acetone.
98. A sealing composition and method for sealing holes in metallic or other sheets, containers or the like.
99. Dipped latex material.

APPENDIX III (B).

Processes evolved under the auspices of the Council of Scientific and Industrial Research and transferred to Supply Development Committee (S.D.C.) Royal Air Force, etc., for development.

Process	Transferred to	State of Utilisation
1. High tension ignition cable testing device for field use.	R. A. F.	Being utilised by R. A. F.
2. Slushing varnishes for metal tanks for petrol storage, and for rubber, sythetic rubber and laminated tanks for carrying petrol in aircraft.	R. A. F. and U.S.A.A.F.	Being utilised by R. A. F. and U. S. A. A. F.
3. Patching cement for repairing rubber and synthetic rubber tanks.	—do—	Being utilised by R. A. F. and U. S. A. A. F.
4. Petrol proof hose pipes	R. A. F.	The process has since been retransferred to the Council for exploitation for civilian purposes.
5. Petrol pump diaphragms proof against petrol, alcohol and mixtures.	R. A. F. and S. D. C.	Being utilised to meet both civilian and military demands.
6. Petrol tank sealing composition	R. A. F.	Full details of the process have been communicated for use to the R. A. F.
7. Smoke candles and distress signals for use in land and aerial operations.	R. A. F. and S. D. C.	Ordnance factories have been entrusted with manufacture.
8. Reclamation and use of perspex.	—do—	The details of the process have been handed over to S. D. C. for utilisation.
9. Non-inflammable water resistant cloth	S. D. C.	The details of the process have been handed over to S. D. C. The process has now been retransferred to the Council for exploitation for civilian purposes.

Process	Transferred to	State of Utilisation
10. Substitute hairlock.	S. D. C.	The details of the process have been handed over to S. D. C.
11. Improved hot food containers	—do—	The details of the process have been handed over to S. D. C. who have since drawn up the specifications.
12. Furfurol	—do—	Released free-of-charge to help utilization of wastes from the rice and starch industries in the country.
13. Plastic collapsible tubes	—do—	The process has since been re-transferred to the Council
14. Lubricants from vegetable oils and vegetable oil mineral oil blends.	—do—	Released free of charge. Messrs. Burmah Shell are already exploiting the process. Numerous other firms have been supplied with necessary information.
15. Carbon electrodes for dry cells, arc lamps and arc welding.	—do—	Since retransferred to the Council. The Estrella Batteries Ltd., Bombay have been entrusted with the manufacture of small electrodes. The Aluminium Corporation of India Ltd., Asansol and a Travancore firm have being entrusted with the manufacture of big electrodes.
16. Tin lining and seaming compound.	Food Department	The process is now being leased out for commercial exploitation to private concerns.
17. Water detecting composition	R. A. F.	Specifications have been drawn up by the Ordnance Laboratories, Kanpur and the S. D. C. for its development.
18. Pyrethrum cream	D. G. I. M. S.	The manufacture was undertaken by D.G.I.M.S.
19. Manufacture of pyrethrum emulsifier	D. G. I. M. S.	The processes have now been retransferred to the Council.

Process	Transferred to	State of Utilisation
20. Thickened fuel for flame throwers and incendiary bombs.	S. D. C.	A satisfactory substitute for aluminium stearate has been developed and the results have been communicated to S. D. C. with whom the question of utilisation is under consideration. The thickened fuel has been found to be satisfactory.
21. Anti-gas cloth	Supply Department	The process has been leased out to various firms in the country free-of-charge. The firms are now in regular production.
22. Treatment of aviation fuel for reducing the vapour lock tendency.	R. A. F.	The results have been communicated to R. A. F. for utilisation.
23. Cellulose dopes	Supply Department	Being utilised by the Supply Department.
24. Clay pigeons	R. A. F.	The material has been approved by the R. A. F. who are developing the process.
25. Hydraulic brake fluid	S. D. C.	Leased out for commercial exploitation to the Indo-Burma Petroleum Co. Ltd., Bombay.

### APPENDIX III (C)

#### Processes released free of cost for civilian use.

##### I. Antigas Cloth

The process was utilised by the following 19 firms :—

1. M/S. Adoni Proofing Co., Alur Road, Adoni (M.S.M. Rly).
2. M/S. A.A. Karim Bros., C/o Ahmed Oil Leather Cloth Factory, Ambernath (G.I.P. Rly) Bombay No. 9.
3. M/S. Antigas Fabrics Co., C/o Cotton Mills Estate Kalachawk Road, Bombay.
4. Baroda Antigas Co., C/o Shri Yamuna Mills, Goya Gate, Baroda.
5. M/S. Billimora Gas Proofing Co., C/o Gaikwar Mills Ltd., Billimora.
6. Bombay Waterproofing & Dressing Co., Khashinath Dhuru Road, Off Cadell Road, Agar Bazar, Dadar, Bombay.
7. The Loco & Carriage Superintendent, Bikaner State Rly., Bikaner.
8. M/S. New Era Textile Mills Ltd., Tulsi Pipe Road, Bombay 16.
9. M/S. Pearl Fabrics Ltd., Modern Mills Compound, Opp. Jacob Circle, Bombay 11.
10. M S. Vasant Vijaya Mills Ltd., 170-71 Worli Road, Bombay 18.
11. M/S. Valian Industries, Admedabad.
12. United Iron & Engineering Works, Bombay.
13. M/S. Pannalal Antigas Fabrics Factory, 1727, Gunj Bazar, Secundrabad (Deccan).
14. Kesoram Cotton Mills Ltd., 42, Garden Road, Calcutta.
15. Vikram Mills Ltd., Post Railwaypura, Ahmedabad.
16. Binod Mills Co. Ltd., Ujjain (Gwalior State).
17. M/S. Buckingham Carnatic Mills, P. O. Box No 66, Madras.

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|--|--|
| 2. Vegetable oil blends as lubricants                  | 18. The Rohit Mills Ltd., Railwaypura Post, Ahmedabad.<br>19. I.R. Swarup & Co., Dilshad, Delhi-Shahdara.<br>The process has been given free to all parties interested in commercial exploitation. |
| 3. Bamboo record needles.                              | Do do  |
| 4. Coffee husk plastics                                | Do do  |
| 5. Fertilizers from phosphatic nodules.                | Revealed to Madras and Bihar Governments.  |
| 6. Urea  | Revealed to Mysore Government for commercial exploitation at Bhadravati.   |
| 7. Mosquito repellent cream.                           | To be revealed free of cost to all parties interested in commercial exploitation.  |
| 8. Signal smokes and flares.                           | Revealed to the Defence Services suppliers   |
| 9. Manufacture of enterovioform.                       | Released to all interested parties free of charge.   |
| 10. Purification of Indian glass sands                 | This process has been revealed to all interested industrialists.   |
| 11. Manufacture of agar agar                           | The process has been revealed to the Director Research, University of Travancore for commercial exploitation.  |
| 12. Standardised filter papers for gas purity tests.   | Adopted at all Test Stations in India.   |
| 13. Bamboo strips for weaving combs.                   | Released to Principal, Government Textile Institute, Madras.   |
| 14. Capping cement for electric bulbs.                 | Released to Indian lamp manufacturers.   |
| 15. Recovery of titanium dioxide from bauxite sludges. | Results published in the Journal of Scientific and Industrial Research.  |

## APPENDIX III (D)

### Review of Processes leased out for Commercial Exploitation.

1. *Air Foam Solution.* The process which was leased out to Messrs. Fire-Extinguisher Corporation, Calcutta was for production of air foam solution which is used to put out large scale fires, particularly fires to petrol and oil tanks and installations. Due to conditions created by the war, the oil installations in various parts of India were liable to air attacks and to prevent the resultant loss large quantities of this store were required. The Supply Department consequently made the process available to firms other than the Council's licensee and arranged supplies of large quantities of the store. With the termination of the war, the heavy demand for the store no longer exists but it is believed that small demands will continue in peace time also.

2. *Bhilawan Stoving Enamel and Allied Products.* This has been one of the productive processes developed by the Council and the licensees, Messrs. Jay Engineering Works, Calcutta continue to be in production.

3. *Glass Substitutes.* This process was developed to meet the exigencies of war and the licensees, Messrs. Indian Glass Substitute Co., Simbhaoli produced 2.5 million sq. feet of the store. The immediate demand for the store no longer exists but it is believed that when the production of synthetic resins is established in India after some time and supplies of suitable quality wire mesh are available in plenty, production of suitable qualities of glass substitutes to compete with similar foreign products will be possible and the process could then be revived.

4. *Identity Discs.* The process for the manufacture of this store never reached the stage of commercial production as the demand was withdrawn before development could be completed. The process may be considered as abandoned as it is not believed that non-metallic identity discs will find favour during peace time.

5. *Jute Boards.* It has not been possible for the licensees of this process, Messrs. Karam Chand Thaper & Bros., Ltd., Calcutta and Messrs. Juggilal Kamalpat, Kanpur to proceed with development for want of the necessary equipment. Heavy hydraulic presses with large platters of about 4 ft. x 8 ft. dimension are needed and it has not been possible to get these from abroad so far. Till this equipment is imported, there is little likli-

hood of the development of the process on a commercial scale. In the meantime the Council is contemplating further investigations to improve the quality of the product and bring it up to the standard of similar foreign material.

6. *Laminated Paper Fibre Boards.* The production of paper fibre boards has declined with the termination of the war and increased imports of vulcanised fibre boards from foreign countries. The Council is, however, developing a new process for the manufacture of vulcanised fibre boards so as to be able to revive the process.

7. *Luminous Paints and Pigments.* This was essentially a war time store and the quantities required in peace time are of a very small order.

8. *Oil Silks.* The firm has been unable to start production due to the scarcity of silk. The position regarding silk is expected to improve and the licensees are being asked to take up the exploitation of the process in right earnest.

9. *Potassium Chlorate.* This process had been leased out to Messrs. Mettur Chemical & Industrial Corporation Ltd., Mettur Dam who manufactured the store for 3 years but then suspended production as according to them the control price of potassium chlorate was low. The economics of the process have been examined carefully and it is believed that the process can be economical if based on a reasonable price of chlorine. In view of the fact that large quantities of chlorine are expected to be surplus in the near future following the establishment of the alkali industry in India, it is believed that this indirect process will be adopted by some industrialists. The Industrial Liaison Committee has recently decided to cancel the licence of Messrs. Mettur Chemical & Industrial Corporation and make the process available to all interested parties.

10. *Plastic Collapsible Tubes.* These tubes were developed to meet the shortage of tin and lead tubes. In view of the supplies of metal tubes being now available, the need for plastic collapsible tubes has disappeared and no development of the process is expected.

11. *Silver Glossy and Transparent Paper.* This was a war time problem which could not be developed for want of the proper quality paper in the country. When supplies of the right type of paper, 100% pulp, are available in plenty, the further development and improvement of the process can be considered.



12. *Small Carbon Electrodes.* The firm to whom the process was leased out, Messrs. Estrella Batteries Ltd., Bombay, have so far been carrying on production on a small scale. They have now imported the machinery for large scale production and a technical expert of the Council has just visited the firm to assess the technical help needed by the firm to start their plant. It is anticipated that this process will soon be developed to meet a major portion of the country's requirements.

13. *Solid Fuel.* The product had a large war time demand and the Supply Department entrusted several firms besides the licensee, with the supplies. Peace time requirements are not so heavy but a market for the product has been created and it has come to stay as a permanent item.

14. *Stearic and Oleic Acids.* Full production has not been possible as the raw materials are generally not available and when available the price is sometimes prohibitive. It is hoped that when the raw material position eases, full production will be ensured by the licensees.

15. *Cork Substitutes.* One of the two licensees did get into production but unfortunately the firm has gone into liquidation. The other is finding difficulty in procuring the equipment, and when this is available, will arrange production. They are keen on developing the process.

16. *Treatment of Manganese ore for Dry Cell Manufacture.* The process is being utilised by the licensee along with the process for the manufacture of small carbon electrodes. It is anticipated that with the stepping up of the production of small electrodes, production of manganese dioxide will also increase.

17. *Water-proof Paint for Indianite Roofing Slabs.* With the delay in the development of the process, the licensee appears to have lost interest in it. The question of ensuring development, if necessary, by leasing it to other firms also is being examined.

18. *Formaldehyde.* The process was developed on a small scale by the Indian Institute of Science, Bangalore but production was stopped in October 1943. The question of further exploitation of the process is under examination.

19. *Petrol Pump Diaphragms.* This process was developed to meet war time demands and with the cessation of hostilities, the demand has decreased also. The superiority of the product is, however, recognised and the licensee is making efforts to find a civilian market for the product.

20. *Indigenous Moulding Powder S.H.P.* The agreement is under cancellation and the release of the process to other parties is expected to be considered shortly.

21. *Vacuum Pumps.* The production of vacuum pumps requires a good workshop fitted with precision machinery. The two licensees who took over the process are awaiting the plant before attempting to produce the pumps.

22. *Dye Extracts and Dye Shades on Wool and Cotton from Terminalia Arjuna and Butea Frondosa.*

23. *Dye Extracts and Dye Shades on Wool from Tamarind Seed Testa.* These two processes were leased out to Messrs. Howrah Trading Co., Calcutta. They are, however, anticipating certain technical difficulties and do not appear to be interested in the process. With the termination of the war, the supply position of dyes has improved. The details of the process are, however, being re-examined with a view to ensuring production.

24. *Anatto Dye Extracts.* Messrs. Dairy Products and Equipment Manufacturing Co. Ltd., Amritsar to whom the process had been leased out, have been wound up. The question of leasing out the process to other parties is being examined.

25. *Atoxyl and Carbarstone.* The firm to whom the process had been released, Messrs. Zandu Pharmaceutical Works Ltd., Bombay have not been able to undertake production due to the non-availability of the necessary equipment.

26. *Dettol Type of Disinfectants.* This process was leased out to Messrs. Bengal Chemical & Pharmaceutical Works Ltd., Calcutta who are producing the store under a trade name. Since then, the details of the process have been incorporated in the British Pharmacopoea and it is possible that other firms may have started production also.

27. *Resin Impregnation of Jute Mill Bobbins.* The licensees are feeling difficulty in equipment and availability of suitable timber needed for the production of these improved jute mill bobbins.

28. *Extraction of Potash Salts from Molasses.* Full details of the process along with blue prints of the furnace design have been made available to the licensees but they have not yet been able to set up their furnaces and production has not yet started.

29. *Calcium Gluconate.* Messrs. Gluconate Ltd., Calcutta to whom the process was released have been handicapped in stepping up production due to non-availability of stainless steel plant. They are trying to import this from abroad and when this is received, production can be expected to increase.

30. *Carbon and Graphite Electrodes.* It has not been possible to ensure production for this process as the investigator, Mr. Bhandarkar has floated a company of his own and has not made the full technical details available to the licensee. The Industrial Liaison Committee has recently considered the matter and the firm has been assured of technical assistance and further investigation, if necessary, in the Delhi laboratories of the Council of Scientific and Industrial Research.

31. *Butter Paper.* Dr. Hamid to whom the process has been leased has evinced no interest in developing the process and the question of releasing it to other firms is being taken up. The paper difficulty is, however, expected to retard progress.

32. *Tin Lining Compounds.* This process had been leased out to Messrs. Renderian Rubber & Chemical Works, Delhi and the details of the process released to them. The process, however, needed improvement in cutting short some of the complicated steps and the samples, from this revised investigation are now being tested.

33. *Hydraulic Brake Fluids.* Messrs. Indo-Burma Petroleum Co., Ltd., Bombay to whom this process had been leased out developed the process and the store is in the market.

34. *Ebonite Substitutes.* This was a war time problem created by acute shortage of rubber. With the easing of the rubber position, the possibility of commercial utilization of this process has receded.

35. *Solid Metal Polish.* The process was only recently released and the firm had not had time to get into production before the riots stepped in.

36. *Resin and Plasticiser Dopes.* This process has had an unfortunate fate. The process was developed to meet war time needs and before its release could be arranged, the Supply Department had entrusted production to two other firms. The licensee could not ensure production due to difficulties of raw material.

37. *Steam-proof Plastics.* This process was leased out to a Sialkot firm but as they did not evince any interest in development the agreement was cancelled. Further action is under consideration.

38. *Crown Cork Cement.* This was a case of solving the difficulties experienced by a local firm and the details were released as technical advice.

- 39. *Utilisation of Nim Oil and its Bitter Constituents.*
- 40. *Sintered Glass Filters.*
- 41. *Rubber Sponges.*
- 42. *Dipper Latex Goods.*

All these processes have been released very recently and it will be some little time before production can be established.

APPENDIX IV  
LIST OF COUNCIL'S PATENTS  
(including pending applications)

Serial No.	Indian Patent No.	Whether sealed or pending	Title	Applicants.
1.	27714	Sealed	Process for Improving the mechanical and physical properties of wood.	S. S. Bhatnagar, L. C. Verman, S. M. Karim and G. D. Joglekar.
2.	27715	„	Improved Process for the production of Lubricating Oils.	J. S. Aggarwal, H. D. Chowdhury and L. C. Verman.
3.	28002	„	A Process for the Conversion of Bhilawan Shell Liquid.	S. Siddiqui and S. K. Ranganathan.
4.	28003	„	A Process for the Conversion of Bhilawan Shell Liquid.	S. Siddiqui and S. K. Ranganathan.
5.	28004	„	A Process for the Conversion of Bhilawan Shell Liquid.	S. Siddiqui and Azhar Ali Khan.
6.	28005	„	A Process for the conversion of Bhilawan Shell Liquid.	S. Siddiqui and Azhar Ali Khan.
7.	28135	„	A Process for the Preparation of Depolarising Agent for Dry Cells.	K. Subbaramiah and L. C. Verman.
8.	28277	„	Improvements in or relating to Laminated Boards.	S. S. Bhatnagar, C. A. R. Khan and L. C. Verman.
9.	28281	„	Improvements in or relating to Laminated Corrugated Boards.	S. S. Bhatnagar, C. A. R. Khan and L. C. Verman.
10.	28306	„	Improvements in Plastic compositions.	S. S. Bhatnagar and Ali Ahmad.
11.	28307	„	A method of preparing a rubber composition for manufacturing artificial cork, stoppers, refrigerator pads, insulating materials and like substances, and the substances so manufactured.	S. S. Bhatnagar and Ali Ahmad.

Serial No.	Indian Patent No.	Whether sealed or pending.	Title.	Applicants.
12.	28376	Sealed	Improvements in or relating to the degradation of proteinous materials.	Atma Ram, S. S. Bhatnagar, and Karimullah.
13.	28424	„	Process for the conversion of cashew nut shell liquid to a drying product for the manufacture of lacquer varnishes, stoving enamels, water-proofing, electric insulating and plastic compositions, and like materials.	S. Siddiqui and Azhar Ali Khan.
14.	28427	„	Improvements in or relating to the containers, receptacles, utensils and the like.	S. S. Bhatnagar, Prem Prakash and L. C. Verman.
15.	28428	„	A process for obtaining resin from agricultural wastes such as bagasse and jute wastes, and the resin so obtained.	S. S. Bhatnagar, Prakash Narain and G. S. Tiwari.
16.	28563	„	A process for the transformation of castor oil gel into a soluble viscous liquid.	S. K. Ranganathan and S. Siddiqui.
17.	28974	„	Improvements in or relating to the degradation of proteinous materials.	Atma Ram, S. S. Bhatnagar, Karimullah.
18.	28990	„	Duplicating inks.	Miss S. Ram.
19.	29051	„	Modification of a process for the conversion of bhilawan shell liquid to a non-vesicating drying product for the manufacture of lacquer varnishes, stoving enamels, water-proofing, electric insulating and plastic compositions, or like materials.	S. Siddiqui and Azhar Ali Khan.
20.	29128	„	A collapsible tube or the like containers and a method of making the same.	S. S. Bhatnagar and Prem Prakash.

Serial No.	Indian Patent No.	Whether sealed or pending.	Title.	Applicants.
21.	29155	Sealed	A process for the reclamation of rubber wastes for producing substitutes of hard and soft rubber, vulcanite, ebonite, and composite moulding powders, adhesives, impregnating solutions and like products.	S. Siddiqui and Azhar Ali Khan.
22.	29374	"	Process and plant for the manufacture of phthalic anhydride.	S. S. Bhatnagar and N. Ghatak.
23.	29400	"	Padding materials from cocconut coir.	Ali Ahmad, Vidya Sagar Bhatia and S. S. Bhatnagar.
24.	29412	"	Improvements in or relating to fluids used in hydraulic mechanism.	J. S. Aggarwal, S. S. Bhatnagar and L. C. Verma.
25.	29842	"	Water detecting composition.	Atma Ram, Flight Lieut. Cecil V. Lezard and Mulk Raj Verma.
26.	29938	"	A process for the conversion of bhilawan shell liquid to a nonvesicating drying product for the manufacture of lacquer varnishes, stoving enamels, water proofing, electric insulating and plastic compositions or like materials.	S. Siddiqui and Azhar Ali Khan.
27.	29939	"	Improvements in or relating to rendering textile fabric non-inflammable and water resistant.	Atma Ram, S. S. Bhatnagar, Karimullah and C.A.R. Khan.
28.	29940	"	Improvements in or relating to rendering textile fabric non-inflammable and water resistant.	Atma Ram, S. S. Bhatnagar, Karimullah and C.A.R. Khan.
29.	29966	"	Preparation of resinous materials from the milky juice of plant <i>Euphorbia Tirucalli</i> .	Atma Ram, S. S. Bhatnagar, Karimullah and George Choet Smith.

Serial No.	Indian Patent No.	Whether sealed or pending	Title.	Applicants.
30.	29967	Sealed	A process and apparatus for the production of ammonium carbamate.	J. C. Ghosh and B. S. Kulkarni.
31.	29968	"	Water-proof and gas-proof fabrics from castor oil products.	M. Qureshi and T.V. Subha Rao.
32.	29969	"	An apparatus for the production of urea. (Patent of addition)	J. C. Ghosh and B.S. Kulkarni.
33.	30072	"	An ice bag or like container and a method of making the same.	S. S. Bhatnagar and Prem Prakash.
34.	30196	"	A method of and composition for lining and seaming containers.	S. S. Bhatnagar and Karimullah.
35.	30316	"	Cold moulding composition for the manufacture of moisture resistant or insulating articles such as boards, switches, bottle-caps, trays, panels for radio receiving sets or the like.	M. Qureshi and Mohd Abdul Rahim Khan.
36.	30451	"	A process for the manufacture of sintered glassware.	B. V. J. Janakirama Rao.
37.	30502	"	An improved process of the degradation of keratinous materials or the like.	S. S. Bhatnagar and L. C. Verman.
38.	30503	"	An improved pencil eraser.	M. Qureshi and M.A.R. Khan.
39.	30679	"	Improvements in or relating to the production of foam generating substances.	S. S. Bhatnagar, Atma Ram, A. Jogarao, Karimullah and L.C.Verman.
40.	30680	"	Improvements in or relating to the manufacture of containers, receptacles, hollowware or the like from resin impregnated lamination.	S. S. Bhatnagar, A. R. Khan and L. C. Verman.
41.	31282	"	Improvements in or relating to the manufacture of moulding powders.	S. S. Bhatnagar, A. Jogarao and L. C. Verman.



Serial No.	Indian Patent No.	Whether sealed or pending	Title	Application
42.	31283	Sealed	A sealing composition and method for sealing holes in metallic or other sheets, containers or the like.	Atma Ram, S. S. Bhatnagar and Mulk Raj Verma.
43.	31284	"	Varnish from castor oil products.	M. Qureshi and T. V. Subha Rao.
44.	31510	"	Improvements in or relating to the grinding and utilisation of mica.	Ramesh Chandra Ray.
45.	31511	"	Improvements in or relating to the grinding and utilisation of mica.	Ramesh Chandra Ray.
46.	31594	"	Anthraquinone vat dyestuffs.	V.V. Gokhale and K. R. Venkataraman.
47.	31595	"	Improvements in or relating to rendering paper water-proof greaseproof and non-porous.	Karimullah, G.S. Tiwari.
48.	31877	"	Improvements in or relating to the manufacture of flux compositions for aluminium or its alloys.	S. S. Bhatnagar and A. L. S. Rao.
49.	32237	"	Improvements in or relating to the expulsion of the shell liquid from bhilawan or cashew nuts.	S. Siddiqui and Azhar Ali Khan.
50.	32352	"	Improvements in extraction of rubber from <i>cryptostegia</i> .	S. S. Bhatnagar, Karimullah and Uma Shanker.
51.	32486	"	Improvements in or relating to the manufacture of benzidine.	B. B. Dey, T. R. Govindachari, and S. S. Rajagopalane.
52.	32823	"	Improvements in the production of raised patterns or lettering on the surface of plastic products.	B. N. Sikka, Gurbax Singh, L. C. Verman.
53.	32824	"	Manufacture of containers from resin impregnated lamination.	B. N. Sikka, Gurbax Singh and L. C. Verman.
54.	32834	"	Improvements in or relating to the manufacture of mica incorporated boards, slabs, tiles, or the like (cement mica composition).	R. C. Ray.

Serial No.	Indian Patent No.	Whether sealed or pending.	Title.	Applicants.
55.	32969	Sealed	Improvements in or relating to the manufacture of paints from mica.	R. C. Ray.
55.	32970	„	Improvements in or relating to electro-deposition of rubber (rubber lined equipment).	J. C. Ghosh and George T. Verghese.
57.	32971	„	Extraction of rubber from <i>cryptostegia</i> leaves.	S. S. Bhatnagar, Karimullah and Uma Shankar.
58.	33058	„	Improvements in or relating to rubber lining of non-conducting surfaces.	J. C. Ghosh.
59.	33059	„	Gas cleaning devices for use in conjunction with producer gas plant.	S. K. Dass Gupta, Mohan Lal Khanna, K. K. Achuthan Nair and L. C. Verman.
60.	33077	„	Improvements in the manufacture of plastic composition from pulverised mica (glycerine geletine mica gel).	R. C. Ray.
61.	33078	„	Improvements in the manufacture of paramino phenol.	B. B. Dey, T. R. Govindachari and S. C. Rajgopalane.
62.	33114	„	Improvements in or relating to the manufacture of paints from mica No. 2.	R. C. Ray.
63.	33115	„	Improvements in or relating to the rubber lining of metallic equipment.	J. C. Ghosh and George T. Verghese.
64.	33261	Accepted	Improvements in or relating to the production of stabilised diazo salts.	R. J. Monalim and K. Venkataraman.
65.	33473	„	Improvements in or relating to the production of nitro derivatives of phenyl ethers.	B. B. Dey, T. R. Govindachari and H. V. Udupa.
66.	33649	Sealed	Isolation of bitter principles from nim oil and from one another.	S. Siddiqui and C. R. Mitra.
67.	33650	„	Separation of the bitter principles from nim oil and simultaneous purification of the oil (nim-1).	S. Siddiqui and C. R. Mitra.

Serial No.	Indian Patent No.	Whether sealed or pending.	Title.	Applicants.
68.	33651	Sealed	New derivatives from bitter principles of nim oil.	S. Siddiqui and C. R. Mitra.
69.	33786	"	Improvements in the working life of jute or cotton mill bobbins, textile shuttles or the like mill accessories.	S. S. Bhatnagar, L. C. Verman, S. M. Karim and A. N. Nayar.
70.	33787	Accepted	A method of adjusting watches and time pieces.	L. C. Verman.
71.	34040	"	Improvements in or relating to containers of the cigarette case type.	Gurbax Singh and L. C. Verman.
72.	34210	Sealed	Improvements in or relating to anthra quinone acid dyestuffs.	S. G. Bedekar and K. Venkataraman.
73.	34211	Accepted	Manufacture of 2 : 4 dichloro-1-amino Anthraquinone.	K. Venkataraman and S. G. Bedekar.
74.	34410	"	Manufacture of mosquito-repellant cream	S. Siddiqui and C. R. Mitra.
75.	34411	"	Conversion of nitro chloro-benzenes.	B. B. Dey, H. V. Upuda, T. R. Govindachari.
76.	34692	"	Improvements in or relating to air seperators.	G. D. Joglekar.
77.	34754	"	An improved process for the conversion of ortho and para nitro chloro benzenes to the corresponding nitro anisoles and nitro phenetoles.	B. B. Dey, H. V. Udupa, T. R. Govindachari.
78.	34755	"	An improved process for the preparation of 2 nitro, 4 chloro phenetoles.	B. B. Dey, H. V. Udupa, T. R. Govindachari.
79.	34756	"	An improved process for the production of ortho dichloro benzidine (3,3' dichloro 4,4' diamino diphenyl.)	B. B. Dey, T. R. Govindachari and S. G. Rajgopalane.
80.	34757	"	Process for the production of 3,6,3',6' tetra chloro benzidine.	B. B. Dey, T. R. Govindachari and S. G. Rajgopalane.

Serial SNo.	Indian Patent No.	Whether sealed or pending	Title	Applicants.
81.	34766	Accepted	Improvements in or relating to magnetic separators.	G. D. Joglekar and L. C. Verman.
82.	34873	"	Improved apparatus for expulsion of bhilawan shell liquid.	S. Siddiqui and Azhar Ali Khan.
83.	34937	"	Improvements in or relating to coating composition for card board containers.	S. M. Karim and K. K. Sarin.
84.	34938	"	Improvements in or relating to the depolymerisation of rubber.	S. Siddiqui, Azhar Ali Khan and B. C. Majumdar.
85.	35328	Filed	An improved method for the production of 2-4 diamino phenol.	B. B. Dey, H. V. Udupa and T. R. Govindachari.
86.	35331	"	Manufacture of rubber sponges.	Azhar Ali Khan, B. C. Majumdar and S. Siddiqui.
87.	35336	Accepted	Improvements in or relating to food containers made of paper, card board or fabric.	S. M. Karim and K. K. Sarin.
88.	35337	Filed	Improvements in or relating to card board containers for rendering them suitable for packing non-alkali watery solutions, inks or the like.	K. K. Sarin and S. M. Karim.
89.	35338	"	Improvements in or relating to the manufacture of concentrated extract of pyrethrum.	S. Siddiqui and A. V. Sabharatnam.
90.	35567	"	Improvements in or relating to preventing the deterioration of pyrethrins and preserving the biological stability of pyrethrum preparations.	S. Siddiqui, A. V. Subharatnam and Vishwa Nath Sharma.
91.	35646	"	An improved air cleaning and crank case ventilation system for internal combustion engines.	N. A. Nair and L. C. Verman.

Serial No.	Indian Patent No.	Whether sealed or pending	Title.	Applicants.
92.	36073	Filed	Improvements in or relating to the production of cyclised rubber.	Karimullah and Uma Shankar.
93.	36074	"	Improvements in or relating to the production of chlorinated rubber.	Karimullah and Uma Shankar.
94.	36162	"	Improvements in or relating to the lathes particularly suited for glass working.	Atma Ram, Y. P. Varshney and B. V. Janki Rama Rao.
95.	36163	"	Improvements in or relating to the manufacture of double walled or multi-walled glass flasks such as vacuum or thermos flasks.	Atma Ram, Y. P. Varshney and B. V. Janki Rama Rao.
96.	36182	"	Improvements in or relating to the manufacture of tin free alloys possessing physical and chemical properties similar to tin bearing alloys.	D. R. Malhotra, B. D. Aggarwal and Braham Prakash.
97.	36318	"	Improvements in or relating to the manufacture of rubber compounds for lining or sealing containers for the manufacture of dipped goods or the like.	Karimullah and Uma Shankar.
98.	37155	"	Improvements in or relating to the preparation of aluminium alloys.	D. Sarup, V.G. Iyer and S. Rama Murthy.
99.	37566	"	An improved method for the production of 2,4 diamino phenol.	B. B. Dey, B. R. Pai and H.V. Udupa.
100.	38062	"	Improvements in or relating to the conversion of bhilawan shell liquid to a non-vasicating drying product for the manufacture of air drying varnish composition (7).	S. Siddiqui.

Serial No.	Indian Patent No.	Whether sealed or pending.	Title.	Applicants.
101.	38063	filed	Improvements in or relating to the conversion of bhilawan shell liquid to a non-vasicating drying product for the manufactures of lacquer varnish, stoving, enamels water proofing or like materials (8).	S. Siddiqui and D. C. Dhar.
102.	38064	„	Improvements in or relating to the composition particularly suited for the manufacture of patent leather.	S. Siddiqui and D. C. Dhar.
103.	to be filed		Improvements in or relating to the production of distillery washes.	Aswatha Narayana Rao and M. Sreenivasa.
104.	to be filed		Improvements in or relating to the activation of bauxite for bleaching purposes.	Sutaone and Saletore.

### FOREIGN PATENT APPLICATIONS

#### U. S. A.

Patent No.	Whether sealed or pending.	Title.	Applicants.
1. U. S. Pat. Appln. No. 577112 dated Feb. 9, 1945.	Filed	Improvements in or relating to the manufacture of containers, receptacles, hollow-ware or the like from resin impregnated laminations.	S. S. Bhatnagar, A. R. Khan and L. C. Verman.
2. U. S. Pat. Appln. No. 677608 dated June 18, 1946.	Filed	Improvements in or relating to the manufacture of containers receptacles, hollow-ware or the like from resin impregnated laminations.	B. N. Sikka, Gurbax Singh and L. C. Verman.

Patent No.	Whether sealed or pending.	Title.	Applicants.
3. U. S. Pat. Appln. No, 745056 dated Apr. 30, 1947.	Filed	Improvements in or relating to magnetic separators.  United Kingdom	G. D. Joglekar and L. C. Verma.
4. British Patent No. 592762 Appln. No. 8340/45.	Accepted	Improvements in or relating to the manufacture of containers, receptacles hollow-ware or the like from resin impregnated laminations.	S. S. Bhatnagar, A. R. Khan and L. C. Verma.
5. British Patent Appln. No. 19943/46.	Filed	Improvements in or relating to manufacture of containers receptacles, hollow-ware or the like from resin impregnated laminations.	B. N. Sikka, Gurbax Singh and L. C. Verma.
6. Br. Pat. Appln. No. 25410/46.	Filed	Manufacture of 2 : 4 dichloro-1-amino anthraquinone.	K. Venkataraman and S. G. Bedekar.
7. Br. Pat. Appln. No. 25409/46	Filed	Improvements in or relating to anthraquinone acid dyestuffs.	K. Venkataraman and S. G. Bedekar.
8. Br. Pat. Appln. No. 10893/47.	Filed	Improvements in or relating to magnetic separators.	G. D. Joglekar and L. C. Verma.

## APPENDIX V

*List of publications by the Council's technical staff including staff working at different research institutions and universities on schemes financed by the Council.*

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9. Particle-size distributions in red lead pigments, by Verman L.C. and Jogarao A. Jour. Sci. and Ind. Res., 1, 82, 1943
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  329. Progress of Science in India by Bhatnagar S. S., address at the Silver Jubilee Celebrations of the Royal Institute of Science, Bombay, 15th Nov. 1945.

**Theses submitted utilising the work carried out under the  
auspices of the Council of Scientific and Industrial Research.**

**M. SC. TECH.**

- V. V. Gokhale ... Anthraquinone vat dyestuffs.  
S. G. Bedekar ... Some halogenated intermediates and dyes of  
the anthraquinone series.

**PH.D.**

- K. I. Narasimhan ... Coupling and other experiments on natural  
phenolic colouring matters.  
R. J. Moualim ... The chemistry of some commercial dyes.  
S. V. Sunthakar ... Aminoanthraquinones and anthrimides (to be  
submitted).

**List of Monographs and Reports published by the  
Council of Scientific and Industrial Research**

1. Report of the Dyestuffs Exploratory Committee.
2. Report of the Dyestuffs Exploratory Committee—Appendices  
1946.
3. Indian Graphite.
4. Survey of Indian Vetiver (Khus) and its Oil.
5. Report of the Essential Oil Advisory Committee—2nd Edition.
6. Washability of Indian Coal (in press—will be out shortly)
7. Report of Coal Blending and Coking Committee (in press)
8. Silk Production and Weaving in India (in press)

## APPENDIX VI

### Subsidised Research at Universities and Research Institutes.

No.	Name of Institution	Place	Nature of Problem.	Names of Investigators	Total amount of grant in Rs.
1.	Aligarh University	Aligarh	1. Investigations on alkaloids from Chandni roots. 1940—	Dr. R.H. Siddique (under suspension)	12,390
			2. Chemical investigations on the active principles of Karaaf seeds. 1944-45	Dr. M.O. Farooq (under suspension)	2,980
			3. Isolation of the gelatinizing principle of Bemisal Bel 1947—	Dr. M.A. Aziz	3,040
			4. Scheme on 'Sahar Farsce' 1947—	Dr. M.O. Farooq	3,040
2.	Allahabad University	Allahabad	1. Manufacture of cheap radio sets and volume controls 1941-46	Dr. G.R. Toshniwal	29,503
			2. Manufacture and utilization of rosin 1946—	Dr. N.R. Dhar	6,180
			3. Measurement of absorption co-efficient for sound waves in air and other polyatomic gases 1947—	Dr. R.N. Ghosh	5,378
			4. Chemical effects of X-ray emission and absorption spectra 1947—	Dr. G.B. Deodhar	2,778
			5. Thermionic functions of metals and alloys. 1945—	Sir K.S. Krishnan	3,940
			6. Electrical properties of alloys in the liquid state. 1945—	„	2,800



No.	Name of Institution	Place	Nature of Problem	Names of Investigators	Total amount of grant in Rs.
			7. Investigations on electrical properties of some typical order—disorder alloys particularly in the neighbourhood of their Curie temperatures and on the influence of quenching on those properties. 1944—	Sir K. S. Krishnan	8,357
3.	Andhra University.	Waltair	1. Ceramic glazes and colours. 1942—	Dr. G. Gopal Rao	10,015
4.	B. B. C. I. Rly. Workshop.	Ajmer	1. Development of copper-silicon bronzes. 1944-46	Dr. D. R. Malhotra	8,583
5.	Benares Hindu University	Benares	1. Purification of glass sands. 1940-43	Dr. A. Nadel	7,225
			2. Preparation of diethylphthalate. 1942-45	Dr. S. S. Joshi	5,475
			3. Manufacture of potassium perchlorate. 1943-44	Dr. S. S. Joshi	545
			4. Manufacture of carbon disulphide from sulphur and charcoal 1942—	Dr. N. N. Godbole	14,009
			5. Neem oil as a denaturant of alcohol. 1940—	"	8,888
			6. Production and testing of aluminium titanium alloys. 1944-47	Dr. Daya Swarup	7,834
			7. Manufacture of chemical porcelain. 1945—	Prof. V. G. Iyer	8,425
			8. Manufacture of better-class saggars. 1945—	Prof. H.N. Roy	24,710
6.	Bengal Immunity Research Laboratories.	Calcutta	9. Manufacture of seger cones. 1945—	"	9,114
			1. Preparation of 8-amino-quinolines as possible anti-malarials. 1947—	Dr. U. P. Basu	3,000

No.	Name of Institution	Place	Nature of Problem	Names of Investigators	Total amount of grant in Rs.
7.	Bengal Tanning Institute.	Calcutta	1. Scheme on leather research 1946—	The Superintendent, Tanning Institute.	27,236
8.	Biochemical Standardisation Laboratory.	Calcutta.	1. Preparation of optically active and racemic forms of compounds (Pharmacological part) 1946— 2. Compilation of a brochure on the indigenous drugs of India. 1947—	Dr. B. Mukerjee and Dr. B. B. Roy Dr. B. Mukerjee and Mr. N. N. Ghosh	5,920 2,250
9.	Bombay University (Department of Chemical Technology) Bombay.	Bombay	1. Compilation of a list of organic and inorganic materials for dye-stuff industry. 1941-42 2. Manufacture of synthetic dyes from catechin 1943— 3. Determination of the constitution of some commercial dyes 4. Preparation of vat dyes 1941— 5. Method of extraction of vegetable dyes 1940-43 6. Manufacture of aniline from chloro-benzene 1941-45. 7. Economic utilization of hungay oil & kokum butter. 1942-44 8. Manufacture of sulphur black from benzene. 1943-46 9. Sulphonation of vegetable oils. 1940-45 10. Economic utilization of turpentine oil for the manufacture of terpenol. 1944—	Dr. K. Venkataraman " " " " Dr. G. P. Kane Dr. R.D. Desai and Dr. P.N. Joshi. " Dr. K.G. Naik Dr. R.D. Desai and Dr. P.N. Joshi	1,192 8,470 3,154 55,490 4,100 12,649 2,372 4,071 6,192 1,500
10.	Bose Research Institute.	Calcutta	1. Cutting and testing of quartz crystals. 1942-44	Dr. D.M. Bose	6,200

No.	Name of Institution	Place	Nature of Problem	Names of Investigators	Total amount of grant in Rs.
			2. Setting up of a powerful ultrasonic generator. 1940—	Dr. D.M. Bose	23,115
			3. Setting up of a medium-voltage positive-ray discharge tube for the investigation of nuclear disintegration. 1945—	"	9,627
			4. Investigations on trans-uranic elements. 1946—	"	11,600
11.	Botanical Gardens.	Calcutta	1. Rose Cultivation. 1944—	Dr. K.P. Biswas	4,986
12.	Calcutta University (College of Science)	Calcutta	1. Plastics from vegetable oils. 1940-42	Prof. M.N. Goswami	3,651
			2. Splitting of oils. 1940-42	"	3,550
			3. Extraction of ionone from lemon grass. 1940-43	"	9,600
			4. Utilization of commercial xylene for Dettol type of compounds. 1940-42	Mr. P.C. Mitter	1,713
			5. Manufacture of atropine, emetine, etc. 1940-43	"	7,575
			6. Preparation of Enterovioform. 1942-45	"	8,888
			7. Extraction of potash salts from molasses. 1940-43	Mr. P. Ray and Dr. B. Mukerjee	10,171
			8. Preparation of mono and dialkyl anilines. 1941-44	Mr. B.C. Roy	9,164
			9. Preparation of alpha-naphthaline 1942-44	Mr. B. C. Roy	4,400
			10. Radium contents of Indian minerals and mineral springs. 1943-44	Dr. B. D. Nag Chowdhry	1,500

No.	Name of Institution	Place	Nature of Problem	Names of Investigators	Total amount of grant in Rs.
11.			Devising a method for testing the quality of optical glass 1940-43	Dr. S. C. Sirkar	2,065
12.			Survey and production of insulating materials and dielectrics for high frequencies. 1940-45	Prof. S. K. Mitra	2,350
13.			Design of electro-acoustical and high frequency apparatus. 1940-45	"	18,957
14.			Ionospheric investigations 1943—	"	20,475
15.			Manufacture of radio valves in India 1942--	"	41,682
16.			Development of a new technique of investigating the ionosphere. 1946—	Prof. S. K. Mitra and Mr. B. M. Banerjee	6,278
17.			Manufacture of vacuum pumps, compressor and refrigeration machinery. 1941—	Prof. M. N. Saha	81,182
18.			Measurement of geological time in India 1944 —	"	14,461
19.			Theoretical investigation on the upper atmosphere. 1943—	"	20,668
20.			Low temperature carbonization of coal 1943—	Dr. B. N. Ghosh	26,365
21.			Extraction of rare earths from monazite sands. 1941—	Dr. P. B. Sirkar	42,987
22.			Chemical composition of the Tipper's collection of rare earth minerals in India. 1947—	"	12,794

No.	Name of Institution	Place	Nature of Problem	Names of Investigators	Total amount of grant in Rs.
			23. Fermentative production of butyl alcohol, acetone and of acids generally from molasses. 1943—	Dr. B. C. Guha	53,498
			24. Development of air-driven ultra-centrifuge. 1944—	Prof. K. Roy	29,723
			25. Research on cosmic rays. 1945—	Mr. P. C. Bhattacharya	13,661
			26. Raman spectra and luminiscence of organic compounds at low temperatures. 1947—	Dr. S. C. Sirkar	3,678
			27. Micro-waves emitted from extra-terrestrial sources. 1947—	Dr. H. Rakshit	36,160
			28. Design of moving iron ammeters and voltmeters of commercial grades. 1944—	Prof. P.C. Mahanti	12,140
13.	Cotton Technological Laboratory, Indian Central Cotton Committee.	Bombay	1. Survey of cellulose-bearing materials of India 1941—	Dr. Nazir Ahmad and Dr. D.L. Sen	23,863
14.	Dacca University.	Dacca	1. Desulphurising of coal. 1943—	Dr. J. K. Chowdhry	31,568
			2. Investigations on steroids. 1944-47	Dr M.C. Nath	11,306
			3. Chromium-plating on glass, wood and other non-metallic materials. 1946—	Dr. B.C. Kar	9,280
15.	Delhi University	Delhi	1. Spectroscopic investigations on fuels and their combustion. 1944—	Dr. W.M. Vaidya	29,277
			2. Preparation and production on a large scale of pure amino-acids from various natural resources and by synthetic methods. 1947—	Mr. Mansaram	3,040

No.	Name of Institution	Place	Nature of Problem	Names of Investigators	Total amount of grant in Rs.
16.	Department of Agriculture, Madras.	Madras	1. Khus roots. 1944-46	Mr. C.T. Ityachan	8,583
17.	Department of Agriculture, U.P.	Dehra Dun	1. Cultivation of Oscimum plants. 1947—	Director of Agriculture	5,000
18.	Department of Industries, Travancore.	Trivendrum	1. Agar—agar from sea-weeds. 1942-43	Dr. K. Moudgil	500
19.	Director of Industries, C.P.	Nagpur.	1. Cultivation of patchouli in the Central Provinces. 1943—	Director of Industries, C. P.	2,000
20.	Drug Research Laboratories	Jammu	1. Survey, cultivation and improvement of medicinal plants. 1947—	Sir R. N. Chopra	4,300
21.	Fuel Research Institute	Dhanbad	1. Physical and chemical survey of Indian coals.	Dr. Lahiri.	9,500
22.	Government of Bombay	Bombay	1. Procelain containers for hydrogen peroxide 1944—	Mr. C.P. Shah	2,500
23.	Government of India Mint	Poona Bombay	2. Cultivation of palma rosa 1944— 1. Electrolytic oxidation of potassium manganate to potassium permanganate 1947—	Mr. C. C. Mitter	2,000 3,400
24.	Government Silk Institute.	Bhagalpur	1. Standardisation of dye extracts from the barks of Butea-Frondosa.	Mr. M. N. De	6,421
25.	Indian Association for the Cultivation of Science.	Calcutta	1. X-ray studies of metals and alloys 1946— 2. Study of formation of vortices both theoretical and experimental under conditions obtaining in solar atmosphere. 1947— 3. X-ray investigations of coal 1947—	Mr. K. Banerjee Dr. S. K. Banerjee Mr. K. Banerjee	11,146 8,900 9,600

No.	Name of Institution	Place	Nature of Problem	Names of Investigators	Total amount of grant in Rs.
26.	Indian Forest Research Institute.	Dehra Dun	1. Survey of aromatic chemicals of India 1944-45	Dr. S. Krishna	2,000
			2. Survey of aromatic plants of India 1946—	"	5,000
27.	Indian Institute of Science.	Bangalore	1. Manufacture of formaldehyde. 1940-44	Sir J.C. Ghosh	12,318
			2. Manufacture of super phosphates. 1941-45	"	40,953
			3. Manufacture of titanium dioxide. 1942-45	"	13,314
			4. Manufacture of potassium chlorate. 1941-43	"	7,653
			5. Manufacture of phosphorus. 1941-44.	"	17,734
			6. Manufacture of graphite electrodes. 1940-43	Prof. K. Aston	25,244
			7. Manufacture of condensers and resistances. 1940-43	"	12,785
			8. Manufacture of organo-arsenical compounds. 1940-45	Prof. P.C. Guha	10,433
			9. Manufacture of sodium cyanide. 1941-43	Sir J.C. Ghosh	7,250
			10. Manufacture of carborandum and its finished products. 1940-43	Prof. K. Aston	3,785
			11. Manufacture of synthetic adrenaline. 1942-45.	Dr. P. C. Guha	7,678
			12. Pilot plant experiments on aniline, nitrobenzene, etc. 1942-45	"	52,417
			13. Electric furnace treatment of coal rich in sulphur. 1946—	Sir J. C. Ghosh	15,027

No.	Name of Institution	Place	Nature of Problem	Names of Investigators	Total amount of grant in Rs.
14.			Manufacture of hydrogen peroxide. 1942—	Sir J. C. Ghosh	49,760
15.			Manufacture of polythene by the hydrogenation of rubber latex. 1943—	"	21,185
16.			Production of synthetic methanol. 1945—	"	5,263
17.			Production of metallic sodium and magnesium. 1944—	"	77,093
18.			Beneficiation of gypsum and phosphates from the Trichinopoly area. 1941—	"	24,647
19.			Manufacture of beryllium alloys 1944—	"	19,815
20.			Extraction of sulphur compounds from coal. 1942—	"	31,263
21.			Manufacture of butadiene 1943—	"	32,701
22.			Preparation of formaldehyde from power alcohol.	Dr. S. K. K. Jatkar	7,714
23.			Studies in dielectric constants 1946—	"	8,878
24.			Preparation of pre-digested and concentrated food products from edible seed-cakes 1946—	Prof. V. Subrahmanyam.	9,904
25.			Vegetable milks from oil-seeds and related materials. 1946—	"	16,613
26.			Chemistry of penicillin and other anti-biotics. 1944—	"	55,831



No.	Name of Institution	Place	Nature of Problem	Names of Investigators	Total amount of grant in Rs.
27.			Treatment and utilization of industrial wastes with special reference to the textile mill wastes of Ahmedabad. 1942—	Prof. V. Subrahmanyam	16,592
28.			Utilization of essential oils as disinfectants. 1945—	"	18,418
29.			Manufacture of good quality vegetable rennet 1942—	"	19,107
30.			Cytogenetics of yeast and fungi with a view to evolve new and potent species. 1946—	Mr. M. Sreenivasaya	16,645
31.			National collection of type cultures 1941—	"	55,851
32.			Production of industrial enzymes. 1943—	"	17,198
33.			Study of conditions favouring the increase of alcohol concentration in distillery washes 1944—	"	13,341
34.			Study of industrial wastes as supplemental sources of nitrogen and vitamins for the fermentation industries 1947—	"	4,500
35.			Aromatic chemicals 1945	Dr. P. C. Guha	14,907
36.			Manufacture of coumarin 1947—	"	1,500
37.			Production of phenol by the benzene sulphonic acid process. 1946—	"	7,077
38.			Preparation of novocaine. 1944—	"	15,536
39.			Fatigue in metals and alloys. 1946—	Prof. Frank Adcock	19,600

No.	Name of Institution	Place	Nature of Problem	Names of Investigators	Total amount of grant in Rs.
			40. Development of high-purity manganese and the study of its effects as an alloying element with other non-ferrous metals	Prof. Frank Adcock	
			41. Preparation of musk xylol, musk ambrette and musk ketone. 1947—	Dr. P.C. Guha	4,000
			42. Ultra-sonic velocity in gases and vapours. 1947—	Dr. S.S. Jatkar	3,300
			43. Preparation of new anti malarials.	Dr. P.C. Guha	19,320
28.	Indian Museum	Calcutta	1. Jasmines of India. 1945—	Dr. S.N. Bal	7,410
			2. Crude resin from <i>Pinus Excelsa</i> .	Mr. J.N. Rakshit	—
29.	Indian School of Mines.	Dhanbad	1. Washability of Indian coals 1943—	Dr. C. Forrester	1,05,245
30.	K. G. Medical College.	Lucknow	1. Essential oils from bitter oranges. 1944—	Dr. B.K. Malaviya	2,853
31.	Laxmi Narayan Institute of Technology	Nagpur	1. Utilization of bauxite deposits of C.P. 1945—	Dr. S.A. Salatore	9,678
			2. Investigation on sweet oranges and lemon oils. 1945-46	"	2,500
32.	Madras University (Biochemical Laboratories)	Madras	1. Manufacture of sorbose. 1944—	Dr. M. Demodaran	16,892
			2. Carbohydrate Metabolism in organisms with special reference to oxalic acid and citric acid formations. 1945—	"	15,373
			3. Study of proteins and proteases. 1945—	"	21,093
33.	Madras University (Department of Leather Technology)	Madras	1. Leather Research. 1946—	—	60,000

No.	Name of Institution	Place	Nature of Problem	Names of Investigators	Total amount of grant in Rs.
34.	Meteorological Department, Government of India.	Poona	1. Radiation equilibrium in the atmosphere 1946 -	Dr. K. R. Ramanathan	9,180
		Delhi	2. Infra red radiation from the atmosphere and solar radiation. 1946 -	Dr. L. A. Ramdas	2,748
35.	Mysore Iron Works.	Bhadravati, Mysore	1. Manufacture of resistance alloys 1944 -		20,170
36.	Osmania University, Hyderabad.	Hyderabad	1. Splitting of oils 1940-45	Dr. M. Qureshi	19,562
			2. Briquetting of coals 1944-46	"	4,810
37.	Palaeobotanical Laboratory	Lucknow	1. Investigations of micro-palaeobotanical problems. 1946 -	Prof. B. Sahni	8,680
38.	Patna University	Patna	1. Photosensitising dyestuffs 1940-44	Prof. M. N. Doja	5,700
			2. Utilization of waste mica of Bihar. 1942-46	Prof. R. C. Ray	25,000
39.	Presidency College.	Calcutta	1. Study of polar crystals dissolved in glass systems. 1944 -	Dr. S. K. Majumdar	9,137
			2. Production of mesons with the help of Wilson cloud chamber 1946 -	Prof. R. L. Sen Gupta	4,360
40.	Presidency College.	Madras	1. Manufacture of glandular products and utilization of waste products from sharks 1942 -	Dr. B. B. Dey	31,331
			2. Manufacture of photographic developers 1945	"	3,115
			3. Manufacture of direct cotton colours 1943 -	"	54,145
41.	Provincial Broadcasting Department.	Madras	1. Reconditioning of lead acid batteries 1945	Mr. V. V. L. Rao	15,959
			2. Salvaging of electrolytic condensers 1945 -	"	16,564

No.	Name of Institution	Place	Nature of Problem.	Names of Investigators	Total amount of grant in Rs.
42.	Punjab University	Lahore	1. Manufacture of high grade refractory clays. 1940-46	Prof. M.L. Joshi	32,270
			2. Manufacture of graphite crucibles 1942-46	"	23,258
			3. Manufacture of optical glass. 1940-45	"	32,420
			4. Manufacture of X-ray tubes and kenotrons 1942-46	Dr. P.K. Kichlu	23,345
			5. Manufacture of diamond tools. 1945—	"	13,296
			6. Manufacture of flash lamps 1945—	"	4,140
			7. Photochemistry of ozone 1946—	"	5,561
			8. Preparation of optically active and racemic forms of compounds suitable as medicinal substances (chemical and physical parts). 1946—	Dr. B.K. Singh	5,620
			9. Co-relation of cosmic ray intensity with atmospheric variables 1946—	Dr. P.S. Gill	5,000
43.	"Radon House" Kalighat	Calcutta	1. Manufacture of X-ray transformers 1941-43	Mr. B. B. Bhowmik	10,734
			2. Manufacture of permanent magnets suitable for electrical instruments. 1945—	"	5,620
44.	Ram, S. (Miss)	New Delhi	1. Manufacture of correcting fluid. 1943—	Miss S Ram	—
			2. Manufacture of duplicating ink. 1943—	"	50

No.	Name of Institution	Place	Nature of Problem	Names of Investigators	Total amount of grant in Rs.
45.	Royal Institute of Science.	Bombay	1. Manufacture of photographic materials in India 1941-46	Prof. G.R. Paranjpe	71,060
			2. Manufacture of high-purity salt. 1946—	Dr. Mata Prasad	3,189
			3. Manufacture of gelatin. 1943—	"	20,018
			4. Spectroscopy of fuels and their combustion. 1946—	Dr. N.R. Tawde	18,656
46.	"Salkia", Howrah.	Calcutta	1. Manufacture of graphite crucibles. 1941-46	Mr. S.L. Mukerjee	9,720
47.	St. Xavier's College.	Bombay	1. Establishment of anti-biotic research centre 1947—	Lt. Col. S. S. Bhatnagar	15,540
48.	Tata Institute of Fundamental Research	Bombay	1. Work on astro physics, experimental physics and cosmic radiation. 1946—	Prof. H. J. Bhabha	75,000
			2. High altitude measurement of the penetrating component of cosmic radiation and ground experiments on mesons 1946—	"	20,000
			3. Establishment of a betatron high energy accelerator. 1946—	"	75,000
49.	Tata Iron and Steel Co., Ltd.	Jamshedpur	1. Grain-size control of ferrous and non-ferrous materials. 1946—	Controller of Inspection (Metallurgical) Tisco	29,316
			2. Manufacture of permanent magnets 1942-46	"	48,413
			3. Coke-blending and coking research 1941—	"	1,31,090
			4. Classification and cataloguing of technical literature relating to metals. 1946—	"	4,500

No.	Name of Institution	Place	Nature of Problem	Names of Investigators	Total amount of grant in Rs.
50.	Technological Laboratory	Baroda	1. Preparation of alkali and water soluble ethyl cellulose. 1944—	Dr. C. S. Patel	2,457
51.	U. P. Glass Works	Bahjoi	1. Manufacture of optical glass 1940-43	Mr. I. D. Varshney	8,525
52.	Departmental Schemes, Council of Scientific and Industrial Research Laboratories.	Delhi	1. Manufacture of synthetic wool 1940-46	Dr. S. S. Bhatnagar	51,365
			2. Manufacture of ammonium nitrate 1942-43	Dr. S. S. Bhatnagar and Mr. Parkash Narain	1,300
			3. Titanium dioxide from bauxite sludge 1942-45	Dr. S. Parthasarathy	8,050
			4. Manufacture of ammonium phosphate from calcium phosphate 1940-43	Dr. S. S. Bhatnagar	8,613
			5. Serpentina alkaloids, kurchi alkaloids, industrial uses of bhilawan resins, substitutes of agar-agar and mannite 1940—	Dr. S. Siddiqui	74,618
			6. Pyrethrum and pyrethrum substitutes	"	15,424
			7. Anti-malarial Drugs 1944—	"	26,779
			8. Semi-synthetic tanning material 1944—	"	29,890
			9. Neem oil 1942—	"	42,114
			10. Manufacture of ebonite substitutes and allied products. 1943—	"	20,800
			11. Industrial utilization of resins from latices of <i>euphorbioccea</i> 1944—	Dr. S. S. Bhatnagar and Dr. Karimullah	18,747
			12. Extraction of rubber from <i>cryptostegia</i> 1944-46	"	8,120

No.	Name of Institution	Place	Nature of Problem	Names of Investigators	Total amount of grant in Rs.
13.			Preparation of vitamin B <sub>1</sub> , beemax and marmite. 1944—	Dr. Bashir Ahmad and Mr. P. N. Vohra	18,914
14.			Powder metallurgy 1946—	Dr. K. S. Krishnan	5,703
15.			Carbon electrodes for arc purposes 1940—	"	59,912
16.			Plastics in general 1940—	"	59,803
17.			Polyhydric alcohols from sugars 1944—	Dr. Karimullah	18,747
18.			Investigations of kakra singi, brahmi and brahmi manduki. 1946—	"	10,456
19.			Manufacture of magnesium from magnesite 1942-45 (dropped)	Dr. S. Parthasarathy	7,381
20.			Portable producer gas plant 1942—	Dr. K.S. Krishnan	79,721
21.			Technical applications of ultrasonics	Dr. S. Parthasarathy	33,546
22.			Testing of samples of earth, alloys, broken machinery brought from Hiroshima 1946—	"	150
23.			Manufacture of resistance alloys 1942-44	"	8,560
24.			Extraction of sulphur compounds from coal 1940-46	"	13,716