

GOVERNMENT OF INDIA
MINISTRY OF HEALTH



REPORT
OF THE
KERALA AND MADRAS
FOOD POISONING CASES
ENQUIRY COMMISSION

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INTRODUCTORY

In the months of April and May 1958 there were reports about many persons dying in the States of Kerala and Madras as a consequence of food-poisoning. Incidents were also reported in which persons fell seriously ill of food-poisoning, and after treatment recovered. Till 23rd May 1958, in the Kerala State, there were reports of 1,031 persons having fallen ill on account of food-poisoning, out of whom 108 died. There were reports of illness due to food-poisoning in the district of Trichinopoly in the State of Madras, and of an incident in which 31 persons became ill on account of food-poisoning in the district of Chingleput in the Madras State after partaking of food at a wedding ceremony. A Lok Sahayak Sena Camp was set up at Sasthankotta in the district of Quilon in the Kerala State, and almost the entire strength of 175 members of the B company became ill on 29th April 1958 on account of food-poisoning, and 41 trainees, two members of the army staff, three other persons attached to the camp and 19 children from the villages nearby died. This casualty list of illness and deaths severely agitated the public mind, and the matter was discussed in the Lok Sabha on the 30th of April 1958. On that day, Mr. V. K. Krishna Menon, Defence Minister, announced that a Court of Enquiry was being constituted to enquire into the tragedy at the Lok Sahayak Sena Camp at Sasthankotta. Thereafter a Court of Enquiry under the Chairmanship of Lt. Col. Mishra was constituted.

As a large number of persons had died in the State of Kerala and many more had fallen ill on account of food-poisoning, the State of Kerala constituted a Committee of four persons to examine and submit to it a report on the following terms of reference:—

- “1. To collect and report full details about the cases of food poisoning—fatal and otherwise—which have occurred in the State since 10th April 1958.
2. To trace and report the source of poisoning in each case.
3. To investigate and report the special circumstances or causes, if any, which have led to the occurrence of a number of cases within a short span of time in one part of the State, viz., south of Trichur.
4. To suggest what measures should be taken immediately for the prevention of such cases and for the better care and treatment of the persons affected.
5. To suggest what steps should be taken to ensure that the food articles sold or distributed in shops, hotels, establishments, eating houses, common messes, hostels, etc., are free from contamination and in what manner the efforts of the staff of local bodies and government can be co-ordinated in this regard.
6. To make such other recommendations as are relevant to the scope and purpose of this enquiry.”

It was recited in the preamble of the order that the Government of Kerala were anxious that the causes that led to the occurrence in the State, except at Sasthankotta, should be investigated into in detail and that measures should be devised to prevent its recurrence. The Committee appointed by the Kerala Government arrived at certain conclusions and also made recommendations regarding the setting up of laboratories for analysis of adulterated food and for criminological investigation, for enacting legislation making it obligatory on importers of food to report damage to consignments of food to Harbour Food Inspector, for providing for suspected cases of food-poisoning to be handled as major epidemics, for devising procedure for the seizure and analysis of food stuffs suspected to be contaminated food stuffs, for supervision of godowns and proper enforcement of food laws, for controlling the sale of insecticides and other poisonous drugs, for providing for adequate covering to foodstuffs like sugar, flour, etc., to prevent the evasion of shipping regulations, for preventing storage and transport of poisonous materials with articles of food and for report of damage to any package of poison to the health authorities concerned, and finally for reviewing the conditions regarding the use of folidol as an insecticide in the light of the results of an immediate inquiry into the possible residual effects of spraying, and instructions to planters using folidol to get samples of their products periodically analysed for residual contamination.

In view of the large casualty list, the Government of India issued on 23rd May 1958 Notification No. F.24-83/58-PH, in the Ministry of Health, under section 3 of the Commissions of Inquiry Act, 1952 (60 of 1952). The terms of the Notification are as follows:

“WHEREAS the Central Government has received reports of a large number of cases of food poisoning in various places in the States of Kerala and Madras during the period between the second week of April 1958, and the middle of May 1958, resulting in many deaths, in particular at Parur, Trichur, Tiruppunithura, Sasthankotta and Trivandrum;

AND WHEREAS the circumstances in which the food or foodstuffs came to be contaminated, the contamination remained undetected and the contaminated food or foodstuffs came to be distributed and the necessity of evolving measures to safeguard against similar occurrences in future are definite matters of public importance;

AND WHEREAS the Central Government is of opinion that it is necessary to appoint a Commission of Inquiry for the purpose of making an inquiry into the said matters;

Now, THEREFORE, in exercise of the powers conferred by section 3 of the Commissions of Inquiry Act, 1952 (60 of 1952) the Central Government hereby appoints a Commission of Inquiry consisting of—

1. Shri Justice J. C. Shah, Judge, High Court, Bombay.—
Chairman.
2. Major General Sarup Narain, Principal, Armed Forces Medical College, Poona.—*Member.*

3. Captain T. B. Bose, Chief Surveyor, Mercantile Marine Department, Ministry of Transport, Government of India, Bombay.—*Member.*

2. The said Commission shall inquire into and report on the following matters, and for that purpose may take such evidence as it may consider necessary:

- (a) the circumstances in which and the causes whereby the food or foodstuffs used in preparing the food came to be contaminated;
- (b) whether the contamination could have been avoided or detected in time;
- (c) the action, if any, taken by the person or persons concerned after detection of such contamination to prevent further distribution of the contaminated food or foodstuffs;
- (d) whether there has been any failure in taking adequate measure for the avoidance or timely detection of such contamination and the person or persons responsible for such failure; and
- (e) the measure to be taken to safeguard against similar occurrences in future."

By Notification, dated 3rd June 1958, powers under sub-section (2) of section 5 of the Commissions of Inquiry Act were also conferred upon the Commission.

By Notification, dated 3rd June 1958, Shri V. R. Gadkari was appointed as Secretary to the Commission.

The Commission entered upon the enquiry on 6th June 1958. The Commission held sittings in Bombay on 6th, 7th, 9th and 10th of June in High Court Building. The Commission then proceeded to the Kerala State. Evidence was recorded at Ernakulam on the 12th, 13th, 14th, 15th, 16th and 17th of June. During the course of the sittings the Commission inspected the godowns of Messrs A. V. Thomas & Co. Ltd., and of the Malabar Steamship Co. Ltd., at Mattancheri. On the 17th of June the Commission proceeded to Trivandrum. *En route* the site of the Lok Sahayak Sena Camp at Sasthankotta was inspected. The Commission held sittings on the 18th, 19th and 20th of June and recorded evidence at Trivandrum. The Commission returned to Bombay on the 21st June and held sittings at Bombay on the 25th, 26th and 27th and recorded evidence. Counsel appearing on behalf of the Union of India, the New Dholera Steamships Ltd., Chika Private Ltd., and V. V. Dabke then addressed the Commission on 28th, 29th and 30th June 1958. Some more evidence was recorded on the 30th June 1958.

Having regard to the nature of the enquiry, the Commission was of the view that the procedure as in a civil proceeding with certain modifications be adopted. The Commission ordered that the enquiry shall be a public enquiry. The Commission then examined 150 witnesses. 176 documents were produced.

The State of Kerala had appointed a Food Poisoning Enquiry Committee of four persons, viz., Shri S. Govinda Menon, Dr. C. O. Karunakaran, Dr. N. S. Warriar and Dr. Krishnan Thampi. These four members of the Committee toured the various districts of the State and collected information from the Medical Officers on a questionnaire issued by the Committee, by visits to hospitals where patients were treated, to godowns where suspected food materials were stocked, to the wholesale and retail shops to which the source of poisoning had been traced, and by examining the relatives of the deceased who were able to give useful information. The report made by the Food Poisoning Enquiry Committee was made available to us by Dr. C. O. Karunakaran who was one of the members of the Committee. The conclusions recorded by the Court of Enquiry under the Chairmanship of Lt. Col. Mishra have also been made available to us.

By the Notification issued by the Government of India on the 23rd of May 1958 primarily the Commission is called upon to enquire into the circumstances in which and the causes whereby the food or foodstuffs came to be contaminated and the consumption of which resulted in poisoning various persons between the second week of April 1958 and the middle of May 1958, to enquire whether the contamination could have been avoided or detected in time and to ascertain whether action, if any, was taken by the person or persons concerned after detection of such contamination to prevent further distribution of the contaminated food or foodstuffs and to ascertain further whether there was any failure in taking adequate measures for the avoidance or timely detection of such contamination and the person or persons responsible for such failure. The Commission is also asked to suggest measures to be taken to safeguard against similar occurrences in future.

It is evident that primarily the Commission is concerned to ascertain the causes whereby and the circumstances in which food-poisoning deaths took place in the Kerala and the Madras States. The Commission has to consider whether other persons became ill on account of the food-poisoning, and to ascertain the source of poisoning.

The Commission by the terms of reference is also called upon to ascertain the cases of food poisoning in the Madras State and the Kerala State and the enquiry is restricted to the period between 2nd April 1958 and the middle of May 1958 in respect of food-poisoning cases.

CHAPTER II

SECTION I

VOYAGE NO. 166 OF S.S. JAI HIND FROM BOMBAY TO COCHIN

In dealing with the circumstances in which contamination of foodstuff, which forms the subject-matter of this Enquiry, occurred, it is necessary to refer in detail to the evidence relating to voyage No. 166 of S.S. Jai Hind from Bombay to Cochin Harbour in the last week of March 1958, to the practice followed in loading and unloading cargo of the ships of the New Dholera Steamships Ltd., and in the Bombay and Cochin Ports, and to the circumstances in which the cargo of folidol came to be described as "harmless chemical" and the carboys which contained folidol came to be damaged.

S.S. Jai Hind is a ship registered in India and is owned by the New Dholera Steamships Ltd., which is managed by a managing company named Vikramsee Private Ltd. There are two allied companies which have also figured prominently in the enquiry made by the Commission. They are the New Dholera Shipping and Trading Co. Ltd., and the Malabar Steamship Company Ltd. Messrs. Shoorjee Vallabhdas Private Ltd., are the managing agents of the Malabar Steamship Co. Ltd. Messrs. Vikramsee Private Ltd., are the managing agents of the New Dholera Shipping and Trading Co. Ltd., and Messrs. Pratapsee Private Ltd., are the managing agents of the New Dholera Steamships Ltd. It appears that originally these three companies were started by one Shoorji Vallabhdas who died in or about the year 1951, and Vikramsee and Pratapsee are his two sons. The New Dholera Shipping and Trading Co. Ltd., operates as stevedores in Bombay and in Cochin. All the three companies have a common office at Mattancheri, common godowns and common staff. Of the godown at Mattancheri, the Malabar Steamship Co. Ltd., are the direct tenants from the owner of the building and the New Dholera Shipping and Trading Co. Ltd., and the New Dholera Steamships Ltd., are the sub-tenants of the Malabar Steamship Co. Ltd. The New Dholera Shipping and Trading Co. Ltd.,—which will hereafter be referred to as the "stevedore company"—is primarily engaged in loading and clearance of goods received by the ships of the Malabar Steamship Co. Ltd., and the New Dholera Steamships Ltd. After the goods are cleared, they are stored in the godown of the Malabar Steamship Co. Ltd., at Mattancheri.

S.S. Jai Hind sailed from the Bombay Harbour on 27th March 1958 after loading more than 16,000 packages, crates, bags and other containers of cargo. Captain Jaffer was the Master of the ship, G. Kaimal was the Mate or Chief Officer and P. P. Shendil was the Second Officer. S.S. Jai Hind is a cargo ship with a tonnage of 2,170 tons. It has two holds, fore and aft. Each hold is divided

into two hatches, and in all there are four hatches; but there is no demarcating bulk head which divides the two hatches in each hold. On voyage No. 166 S.S. Jai Hind carried a considerable quantity of cargo, such as wheat flour, maida, rava, sugar, soap, oil, tobacco, cotton, machinery, brass sheets and 55 cases of a liquid insecticide which is marketed by Messrs. Bayers of Germany under the trade name of "Folidol E-605".

Rasiklal Harjivandas, Manager of the New Dholera Steamships Ltd. explained in detail the steps to be taken for loading cargo on a ship. If a shipper desires to ship cargo to another port, he approaches the shipping agent. The shipping agent then enquires of the shipping company whether space is available for the cargo. If space is available, the shipping agent prepares a shipping bill and the shipping bill is submitted to the Customs authorities by the shipping agent. The Customs authorities, after making the requisite entries, retain one copy of the shipping bill with them and return the other copy to the shipping agent. The shipping agent then approaches the Cargo Supervisor. The Cargo Supervisor, after referring to the shipping bill, allows carting of the cargo. The shipping agent then contacts the shed superintendent of the Port Trust, gives a copy of the shipping bill at the dock gate and then arranges to bring the cargo into the dock. At the gate the packages are checked by the Bombay Port Trust authorities and are then allowed to be carried to the wharf. The packages are then received by the receiving clerk of the Port Trust. An employee of the shipping company is also present. The shipping agent then obtains a "no objection" endorsement from the Customs and hands the same over to the Cargo Supervisor and thereafter the cargo is shipped on board. The storage takes place according to the directions of the ship's officer, having regard to the priority to be given in loading and the nature of the cargo. The storing takes place according to the instructions given by the ship's officer to the stevedores. The Chief Officer then issues the Mate's receipt for the consignment and the receipt is handed over to the Port Trust Office by the Cargo Supervisor. The Mate's receipt is taken from the Port Trust by the shipping agent after paying the wharfage charges and then it is presented to the shipping company and thereafter a bill of lading is prepared from the Mate's receipt. The freight to be paid for shipping the cargo is fixed by reference to the Schedule of rates fixed by the Coastal Conference. The freight rate for the cargo which is dangerous is very much higher than the general cargo rate. We have set out the practice relating to consigning and loading of cargo in a ship in some detail to focus attention upon the point that cargo, before it is actually put in the hatch of a ship, comes under the scrutiny of many persons—shipping agents' servants, Port Trust employees, stevedores' employees and the ship's officer. It is surprising, however, that even though on all the 55 crates of folidol the word 'poison' was prominently marked, not one out of the many persons who handled the cargo folidol has admitted that he noticed the word 'poison' on the crates.

One V. V. Dabke is the clearing and shipping agent of Chika Private Ltd. For about eight years Dabke was working as a Customs Dalal for Chika Private Ltd. On 30th April 1958 he became a licenced

clearing and shipping agent. As a Customs Dalal and as a clearing agent he had cleared cargo imported by Chika Private Ltd., from foreign countries by sea and by air. He had also acted as a shipping agent for that company for export of cargo.

On 19th March 1958, Chika Private Ltd., wrote to Dabke to arrange for early transport by sea to Cochin of 55 cases of folidol which were described as "harmless chemical/insecticide for agricultural use". Dabke made inquiries about the ship and, having ascertained that S.S. Jai Hind was proceeding to Cochin within the next few days, prepared the shipping documents, including the customs shipping bill and Port Trust Chalan. He described the consignment of folidol as a cargo of "harmless chemical". He submitted the documents to the Customs Department and got the same registered. Thereafter he went to the dock to obtain the carting order for bringing the cargo from the godown of the Progressive Chemicals, Ltd., a chemical engineering firm which had fabricated and packed the crates of folidol, to the ship. The crates then were brought to a shed in the dock on 24th March 1958. An Export General Manifest was prepared. The cargo was then measured by the Indian Merchants' Chamber. The cargo was taken out of the shed by the Port Trust labourers and was loaded by the stevedore company's labourers in hatch No. 1 of S.S. Jai Hind between 11-2 and 11-9 A.M. on 27th March 1958. Dabke then obtained the Mate's receipt for the cargo loaded. He paid the measurement charges to the Indian Merchants' Chamber and the Port Trust dues, and submitted the Mate's receipt to the office of the New Dholera Steamships Ltd., for preparing the bill of lading. Dabke paid the freight which was calculated at the general cargo rate. The bill of lading received from the shipping company was handed over to Chika Private Ltd., together with his bill by Dabke.

The Customs Manifest which is a record of the cargo shipped was prepared by Janki Nath Joshi, Assistant Collector of Customs, from the shipping bills. It appears to be the practice at the Bombay Port that the shipping bills are shown at two stages to the Customs department, one at the time of registering and the other at the time of carting, but that for coastal cargo there is no system of inspection of the cargo.

Fernandez was the shed superintendent of the Port Trust who assigned space for storage of the cargo of folidol in shed No. 5, after looking at the contents of the shipping bill. Fernandez stated that he was not required to look at the cargo before assigning space for storage in the shed. He only looked at the Export Cargo Register and the shipping bill for that purpose.

H. J. Hegde, the Export Cargo Receiver, prepared the Export Cargo Register from the shipping bill. He stated that he must have seen the cargo of 55 crates of folidol and must have directed the shed superintendent to store the consignment separately because the word 'poison' was stencilled on each crate.

S. N. Deshpande was the tally clerk of the Bombay Port Trust on duty on 27th March 1958. He prepared the tally sheet but there is no entry showing that the crates of folidol were marked 'poison'.

M. H. G. Sayed, an employee of the Port Trust, prepared a tally-sheet of the cargo received from the shippers on the wharf.

T. V. Krishnan, Assistant Manager of the New Dholera Steamships Ltd., signed the declaration in the Export General Manifest that the contents were correct. The Export General Manifest was written from the shipping bills and according to Krishnan it was not part of his duty to go to the docks.

P. C. Purshottam wrote pages 1 to 6 of the Export General Manifest and described the cargo of folidol as "harmless medicine". He stated that he posted the entries without checking up or tallying the goods on the wharf or on the ship.

Bhailal Kotak worked as a tally clerk of the stevedore company on 26th and 27th March 1958 and posted entries in the tally sheets after checking up the articles loaded in the ship. He noted the marks on the crates and entered them in the tally sheet, but he did not make an entry about the mark 'poison' stencilled on the crates. At the time of posting the entries Kotak was sitting on the wharf. L. C. Solanki was another clerk of the stevedore company present on the wharf, and who gave directions to the labourers after looking into the shipping bills to carry the cargo to the ship. He prepared the Mate's receipt and the loading memo.

It is rather a curious circumstance that the shipping bills, Port Trust chalans, Export General Manifest, tally-sheets of the shipping company, Port Trust and the stevedores, loading memo. and the mate's receipt and the bill of lading did not describe the cargo as poison, even though on each crate the word 'poison' was conspicuously stencilled in red. But all the persons who prepared these documents either have denied that it is their duty to inspect the cargo before making entries in the documents prepared by them, or have denied having noted the stencil mark 'poison' on the crates of folidol.

The Master of the Ship, Captain Jaffer, has stated that he is not expected to attend to the stowage of cargo in the hatch, and that he gives directions for storage only if he is specially asked about any dangerous cargo. He denied that he was on the ship when the ship was loaded or that a consignment of a poisonous drug was brought into the hatch. The cargo plan showing the position of the cargo stowed in the hatch is signed by him. He produced the rough and the fair log books.

P. P. Shendil was the Second Officer on the ship. When examined on 10th June 1958 he pleaded "loss of memory" and a "confused state of mind". He offered himself again for examination on 25th of June. It appears from his statement that he was not the "duty officer" when the cargo of folidol crates was stowed into the hatch. He had prepared the cargo plan and the entries describing the cargo in hatch No. 1 were written in his hand. The consignment of folidol was described in the cargo plan as "sundries cases", but according to Shendil this entry was posted by Kaimal, the Chief Officer.

G. Kaimal when examined on 10th of June also pleaded "loss of memory" and a "confused state of mind". From the log book, Export General Manifest and the tally-sheets, it appears that he was the duty officer when the 55 crates of folidol, and some wheat flour, sugar and other foodstuffs and tobacco were loaded on the morning of the 27th March. On the 29th of June 1958 we were informed that G. Kaimal may appear and give evidence again, but on the next day we were informed that he was lying ill in the St. George's Hospital, and unable to give evidence.

Nur Mahmud, the foreman of the stevedores, attended to the stowage of the cargo in the holds of the ship according to the directions of the duty officer. He remembered that he stored the folidol crates on top of the bags of tobacco separated by brass-sheets. He says that he specially approached the Chief Officer when the question of stowage of folidol cargo arose. He went to the Chief Officer and asked for his instructions, and the Chief Officer told him that folidol was a harmless chemical and that is why he stored it in hatch No. 1. He did not, however, note any markings on the crates of folidol.

S. S. Jai Hind was bound for Tuticorin, and it carried cargo for Cochin and Tuticorin. All the cargo in hatch No. 1 was for Cochin. The ship sailed anchor at about 10-30 P.M. on 27th March 1958 and reached Cochin Harbour at about 3 P.M. on 1st April 1958. The entries in the log books maintained by Captain Jaffer show that the sea was calm, and the voyage uneventful.

The hatches were opened at Cochin Port and discharge of cargo commenced at about 8-30 P.M. on the same day. In the Cochin Port, cargo received from the Indian ports is not required to be landed at the wharf. The ship generally remains in the stream and cargo is discharged into barges provided by the steamer companies. As soon as a ship casts anchor, the Cargo Supervisor, the tally clerks, the foreman of the stevedore company and gangs of labourers go on board the ship. The Cargo Supervisor contacts the ship's officers and gets the details of the cargo to be unloaded. An Import General Manifest is prepared by the ship's officers and then the Cargo Supervisor starts discharging the cargo in the barges. The Duty Officer supervises the unloading of the cargo. As soon as a quantity of cargo, which the barge is capable of handling, is discharged, a boat note showing the contents and condition of the cargo is prepared by the Cargo Supervisor. The particulars for preparing the boat note are supplied by the tally clerks. There are two tally clerks for each hatch—one in the hold and another on the deck. The tally clerks check up the condition of the cargo and supply information about the nature and any breakage or leakage of the cargo. The boat note is signed by the duty officer and handed over to the tindal of the barge. The barge then proceeds to the Customs shed. The Customs Officer verifies the details of the boat note from the contents discharged into the barge and signs it in acknowledgment of the correctness of the contents. The boat then proceeds to the godown of the steamship company. When the boat reaches the godown the tindal hands over the boat note to the godown keeper. The godown keeper verifies the boat note and hands over the same to the landing clerk. The goods are then removed from the boat. The landing

clerk sits near the gate of the godown while the goods are being unloaded from the barges. The landing clerk has with him the boat note and a landing book in which the boat notes are copied. When the cargo is lifted from the boat, the labourers announce the marks and the landing clerk tallies the marks. The tally is noted in the landing book by the tally clerk. As soon as the boat note is received in the godown, it is copied out into the landing book. If there is any discrepancy between the boat note and the number or condition of the packages, the landing clerk makes a note about the same in the landing book. Thereafter the goods are taken into the godown. The labourers are employees of the steamship company. The landing clerk assigns the godowns in which the goods are to be stored. The landing clerk will also indicate the portions of the godowns in which the goods are to be stored, but no instructions in writing directing storage of cargo are produced. It is difficult to believe that no record about cargo discharged from a ship would be maintained. Every ship brings to the quay-side near the godown a vast quantity of cargo, and unless the cargo is stored in different godowns and record maintained thereof, delivery to the consignees would be impossible. The consignee then presents the bill of lading or delivery telegram and then the steamer company issues the delivery order. The consignee will prepare an import application and present it into the port along with the delivery order. After the port dues are paid to the port authorities the import application and the bill of lading are taken to the customs. After the same are passed by the Customs they are presented to the godown-keeper for delivery.

After the ship arrives in port the Import General Manifest is received in the office of the shipping company. Four copies of the Import General Manifest are received. After the Import General Manifest is received the clerk of the shipping company puts the line number in all the four copies. One copy is then retained and three copies are submitted to the Customs. The Customs send one of the copies to the port authorities and the remaining two copies are retained with them.

Fernandez was the Cargo Supervisor of the stevedores, when the goods were discharged at Cochin from S.S. Jai Hind. He had selected eight tally clerks, two for each hatch. The clerks who worked on hatch No. 1 on the night of 1st and 2nd April 1958 were Kurup and Hansa. There were ten barges into which the cargo was discharged simultaneously from different hatches. The 55 crates of folidol were discharged in barges Nos. 70 and 170. Ali was the tindal of barge No. 170. In the boat notes Folidol E-605 was described as E. & S. liquid. It appears that in the Import General Manifest the consignment of folidol was described as "crates of E. and S. liquid", and that description was adopted in the boat notes. In boat note No. 22, which was prepared for the cargo discharged in barge No. 170, the following endorsement was made "3 c/s E. & S. Liquid contents slightly leaking", "(3) Bags grains slightly wet and stained". Into barge No. 170 was discharged the cargo of camphor, printing ink, country drugs, grain flour and E. & S. liquid and some metals. In barge No. 70 was discharged the cargo of tobacco, printing ink, camphor soap, E. & S. liquid. The boat notes are 23 and 24 in this behalf, and in boat note 24 there is an endorsement "(1) one case slightly

leaking" and by a cross the leaking crate is shown to be 'E. & S. Liquid' crate. Boat Note 25 for barge No. 70 shows out of 477 bags loaded in that barge on the second trip 17 bags were slightly stained. From boat note 28 for barge No. 350 it appears that out of 650 bags of grain, sugar and flour, six bag covers were slightly stained. Boat note 21 for barge No. 162 shows that 5 bags covers were wet and stained. This barge carried 523 bags of grain flour.

Fernandez, the Cargo Supervisor, says that he did not go into the hatch and merely wrote the boat notes from what he was told by the tally clerks, and made entries regarding the condition of the crates and bags also from the same source. Kurup denies that he had seen the stencil mark 'poison' on the crates when he was on the deck at the time of discharge of the cargo. He says that from the place where he sits it was impossible to see the marks. The condition of the packages only is noted by him from what is announced by the tindaal to whom goods are delivered in the boat. Hansa says that he was only concerned to take note of the number of the packages to be put into the sling. He says that some bags were stored in hatch No. 1 but he is unable to say what the contents of those bags were. He does not remember having seen the word 'poison' stencilled on the crates of folidol. Mahamad Ali, tindaal of barge No. 107, says that he had seen that some of the crates of folidol were leaking and he had kept them near the helm. He is unable to say whether there was any cargo of flour or sugar in the barge. He cannot say whether the leakage was considerable.

One Moolji Cooverji was the landing clerk. He made the landing notes in which the contents of the boat notes were copied. In the remarks column on page 102 relating to 53 cases of folidol there was an entry that 6 cases were leaking. On page 101 there was again an entry in the remarks column that the contents of crate of E. & S. Liquid had leaked out. According to Moolji, when the cargo is unloaded by the labourers, they announce the marks and the number of packages. He then checks up the same and thereafter the goods are stored according to his directions. Heavy goods are then stored in the big godown near the quay and the smaller packages in places indicated by him. It appears that the results of checking the cargo are noted in the landing book in which the boat notes are copied in ink by an employee of the steamship company. It must take some appreciable time to copy out the boat notes in the landing book, and the checking can only be made thereafter. The suggestion of Moolji that the cargo received from the barges is immediately stored in different godowns cannot be true.

The 55 crates of folidol were, it is stated, stored in one of the godowns of the Malabar Steamship Co. Ltd., in the morning of 2nd April 1958. A. V. Thomas & Co. Ltd., who were the consignees, presented the delivery order and took delivery of 40 crates out of the 55 crates on 10th April 1958. They declined to take delivery of the remaining crates because the contents were found leaking. An application for a survey was made on 16th April 1958 and on 23rd April 1958 one M. K. C. Nair, a representative of Pierce Leslie & Co., agents of Lloyds, made a survey of the damage, and submitted a report about the same on 13th May 1958. One Sivan, a representative

of the stevedores, was present at the survey on behalf of the shipping company. At the time of the survey, the crates were opened, and the carboys were taken out, individually weighed and examined and their condition noted. Nair found that the damage to 15 carboys was due to "rough handling in transit". He made the following observations:

"Stoppers cracked, broken or become loose due to rough handling in transit resulting in leakage of contents."

After the survey the 15 crates were removed to the godowns of A. V. Thomas & Co. Ltd., where they were attached by the police on 2nd May 1958. It appears that when the crates were attached the damage to the caps of the carboys was more extensive than the damage noted by M. K. C. Nair at the time of the survey.

By S. S. Jai Hind foodstuffs of the value exceeding rupees two lacs were discharged into the godowns of the Malabar Steamship Co. Ltd. Meghji Malsi Private Ltd., of Mattancheri, Mookan Devassy Ouseph & Son of Mattancheri, Maneklal Bhagwanji of Mattancheri, S. D. K. Parameswaran Pillai of Trivandrum through N. N. Konar, Mane & Co. of Mattancheri and C.L.V. Brothers were some of the consignees of foodstuffs, and A. V. Thomas & Co. Ltd., were the consignees under the bill of lading in favour of Chika Private Ltd., of 55 crates of folidol. This cargo of Folidol was loaded between 11-2 and 11-9 a.m. on 27th March 1958 in hatch No. 1 when Kaimal was the duty officer.

(1) Meghji Malsi Private Ltd., had imported the following foodstuffs:

- (a) 150 bags of Anchor Brand maida from the Wallace Flour Mills Ltd., Bombay. These bags were received by S.S. Jai Hind. Out of these 100 bags were taken to the godowns of the consignee, and of the remaining 50 delivery was given to purchasers from the consignees directly from the godowns of the Malabar Steamship Co. Ltd. 15 out of these bags were sold to John Thomas Porthukkaran of Cochin on 7th April 1958 and 35 bags to Manickam of Trivandrum. These bags were loaded in hatch No. 3.
- (b) 200 bags of Rani Brand wheat flour were imported from the Balaji Maharani Flour Mill. This consignment was loaded in hatch No. 4 of S.S. Jai Hind. 136 out of these bags were taken delivery of by the consignees and the remaining 64 bags were delivered to their customers from the godowns of the Malabar Steamship Co. Ltd. 15 out of these bags were also sold to John Thomas Porthukkaran.
- (c) 51 bags ordered out from Govind Ramji & Co. were loaded in hatch No. 1 of S.S. Jai Hind on voyage No. 166 reached Cochin on 1st April 1958 and out of these delivery of 40 bags was taken on 12th April 1958 and of the remaining 11 bags on 25th April 1958.

2 out of the 40 bags were sold to K. Varid Varid of Ankamali, 1 to K. C. Laurence under a bill which was issued

in the name of Bhaskaran, 1 to K. C. Mathai, 1 to M. K. Chinav, and 8 to Sadashivan out of their godowns by the consignees.

- (d) 50 bags of Anchor Brand wheat pollard ordered out from the Wallace Flour Mills, Ltd., were loaded in hatch No. 3 of Jai Hind on voyage No. 166. On 9th April 1958 10 bags were sold to K. Gopala Pillai of Sasthankotta, delivery being given directly from the godowns of the Malabar Steamship Co. Ltd.

(2) Mookan Devassy Ouseph & Son, Cochin, imported—

- (a) 100 bags of sugar from Jos Thomas of Bombay. The consignment was received in April 1958 by S.S. Jai Hind on voyage No. 166. These bags were stowed in hatch No. 1. Delivery of one bag was taken by L. Chakunny, manager of the firm, on 3rd April 1958, and of the balance delivery was taken on 4th April 1958.

16 out of these bags were sold to K. C. Anthony of Tirup-punithura on 7th April 1958. The packing of the bags was double packing.

- (b) 100 bags of Rani Brand maida from Chhaganlal Khimji & Co., of Bombay, by S.S. Jai Hind on voyage No. 166. These bags were loaded in hatches Nos. 3 and 4.

Delivery was taken from the godowns of the Malabar Steamship Co. Ltd., at Mattancheri, on 3rd April 1958. Out of this 15 bags were sold to K. Gopala Pillai of Sasthankotta on 19th April 1958.

(3) Maneklal Bhagwanji of Cochin imported 50 bags of wheat pollard from Wallace Flour Mills Ltd., Bombay, by S.S. Jai Hind on voyage No. 166. These bags were loaded in hatch No. 1. 15 bags out of this consignment were sold to C. L. V. Brothers on 8th April 1958. C. L. V. Brothers sold those 15 bags to Gopala Pillai on 9th April 1958. Gopala Pillai returned 10 out of these bags which were received at Cochin by boat on 2nd May 1958. The bags were attached by the police.

(4) S. D. K. Parameswaran Pillai ordered out 15 bags of maida from Bombay. The consignment was loaded in hatches Nos. 3 and 4 and was received in Cochin by S.S. Jai Hind on voyage No. 166. It was cleared from the godowns of the Malabar Steamship Co. Ltd. on 3rd April 1958 by N. N. Konar, clearing agent, and despatched by Konar to S. D. K. Parameswaran Pillai. S. D. K. Parameswaran Pillai sold one bag to Bhargawan and another bag to T. V. Narayanswami Reddiar. The remaining 13 bags were sold to others.

After or in course of storage in hatch No. 1 of S.S. Jai Hind the 55 crates of folidol appear to have been damaged. Some of the carboys in which folidol was bottled started leaking. It is not clear whether the leakage occurred when the cargo was stowed into the ship or during the voyage; but from the material before us, which we will presently set out, it is clear that at the time when the cargo was being unloaded at Mattancheri some of the crates were found leaking. This cargo was removed together with other cargo in barges

belonging to the shipping company to the godowns of the Malabar Steamship Co. Ltd. These 55 cases of folidol were consigned by Chika Private Ltd., of Bombay, and the bill of lading was "to self". It is undisputed that the consignment was made to A. V. Thomas & Co. Ltd., the distributing agents of Chika Private Ltd., for the States of Kerala and Madras, and the delivery was, in fact, given to A. V. Thomas & Co. Ltd. The 55 crates of folidol were discharged from S.S. Jai Hind early in the morning of 2nd April 1958. As we have already stated, on 10th April 1958 A. V. Thomas & Co. Ltd., found that 15 out of the 55 cases were damaged and they declined to take delivery of those cases, and took delivery of 40 cases and 15 cases remained in the godown of the Malabar Steamship Co. Ltd. On 23rd April 1958 a survey was held by M. K. C. Nair, representative of Pierce Leslie & Co. Ltd., agents of Lloyds, for assessing the quantum of damage and it was found that about 12 gallons of folidol had leaked out. After the survey A. V. Thomas & Co. Ltd. took delivery of the damaged crates. Out of the 55 crates of folidol consigned by Chika Private Ltd., in each of 50 crates there was a carboy of 15 litre capacity. The carboys were made of polyethylene fabricated from alkathene. Each of the remaining 5 crates contained 20 polyethylene bottles of 1000 cc. (i.e. one litre). At the survey it was found that 1000 cc. containers had not been damaged, but only the 15 litre carboys were damaged. In practically all the cases the damage to the carboys was in the screw-caps which were wholly or partially cracked and liquid folidol had oozed out. The carboys were made by a firm of plastic material manufacturers called Bright Brothers Ltd., and supplied to Chika Private Ltd. The smaller containers, i.e., 100 cc. and 1000 cc. containers, were manufactured by Cosmec Agencies. The crates in which the containers of folidol were stored were made of wooden planks. The empty space between the sides of the wooden container and the carboy was filled with loose straw and the neck of the carboy was fixed in position by two parallel horizontal wooden battens. It appears that there was very little clearing between the top planks of the wooden crates and the screw-caps of the carboys.

Folidol E-605 is a deadly poison which is used as an insecticide or pesticide on diverse crops such as rice, cotton, tea, coffee and tapioca. It is also used in fruit orchards. It is manufactured by Bayers of Germany and Chika Private Ltd., are their agents for distribution in India. Folidol came to be imported for the first time in India some time about the year 1952. Initially folidol was being imported in aluminium containers of 100 cc. and 1000 cc. capacity. On those containers, there were paper labels with the word 'poison' printed in red ink and large letters wrapping round 2/3 of the surface of the container. The containers also exhibited the approved international medallion of cross bones and skull, denoting that the contents were a highly poisonous substance.

Some time about the year 1957 Chika Private Ltd., started formulating folidol in India under an arrangement with their principals Messrs. Bayers of Germany. Folidol is an emulsion of parathion (di-ethyl paranitrophenyl thiophosphate) an organo-phosphorous compound, which is the principal component and its poisonous agent. Folidol is an emulsion containing 46.7 per cent. of parathion.

Chika Private Ltd., started receiving parathion and the emulsifying agent in separate steel drums. They purchased the 15 litre polyethylene carboys together with the screw-caps from Bright Brothers Ltd. The smaller containers of 100 cc. and 1000 cc. capacity with a heat-sealing device were obtained from Cosmec Agencies. These smaller containers had beside the heat-sealing device a plastic screw-cap. The carboy had no heat-sealing device, but was closed by a screw-cap by hand manipulation. The processing of folidol in India on behalf of Chika Private Ltd., from parathion and the emulsifying agent was entrusted to Progressive Chemicals Ltd. Under an arrangement made with Chika Private Ltd., the 15 litre carboys were directly supplied by Bright Brothers Ltd., to Progressive Chemicals Ltd., and that firm processed folidol according to the instructions given to them and bottled it into containers as directed by Chika Private Ltd. On the carboy, the name 'Folidol E-605', the number of the carboy and "Chika Private Ltd." were stencilled in black letters and the word "poison" was stencilled in red letters. After the screw-cap of the carboy was fixed in position by hand manipulation it was kept in a wooden container and the empty space between the container and the carboy was filled with straw. The carboy was then kept in a crate and its neck was fixed in position by wooden battens and the top was nailed by wooden planks. The bottling, packing and labelling of folidol were carried out in the factory premises of Progressive Chemicals Ltd. On the crates again were stencilled in black ink the name of the manufacturers, the name of Chika Private Ltd., a medallion of Bayers, the words "Folidol E-605", the corresponding number of the carboy and the word "poison" in red ink in one-inch letters. We need not set out in any detail the method of packing of the smaller containers of 100 cc. and 1000 cc. capacity. It may be sufficient to state that the large carboys of 15 litres and 100 cc. and 1000 cc. containers were fabricated from alkathene. The screw-caps of 15 litre carboys and 1000 cc. containers were also of alkathene. For the screw-caps of 100 cc. containers a fragile plastic material was used. After the carboys and the containers were duly packed in crates, under the supervision of a representative of Chika Private Ltd., the same were under the directions of Chika Private Ltd., removed by their labourers to the wharf or to the railway station for despatch to the mofussil agents.

As we have observed, 55 crates were despatched by S.S. Jai Hind to Cochin for A. V. Thomas & Co. Ltd. All these 55 crates were delivered to A. V. Thomas & Co. Ltd. 15 out of these crates were damaged.

In the letter of instructions, dated 19th March 1958, from Chika Private Ltd., in the shipping bill signed by Dabke and in the bill of lading for the cargo of 55 crates, the contents were described as "harmless chemicals". The description of the contents of the carboys and smaller containers was undoubtedly false.

Each case of folidol was marked "poison". Each crate contained a quantity of deadly poison sufficient to kill many hundred persons in a few hours. But by the letter, dated 19th March 1958, by which Chika Private Ltd., intimated to Dabke of their intention to consign that cargo to Cochin as "harmless chemicals/insecticide for agricultural use", the shipping company was, it appears, persuaded to accept this cargo of deadly poison as harmless chemical.

S. S. Jai Hind has no 'tween deck or separate arrangement for stowage of dangerous cargo, chemicals or liquids away from food-stuffs, and it is clear from the cargo plan and the tally-sheets that the cargo of foodstuffs, liquids, chemicals, toilet materials and folidol were stored in one hold.

Conflicting versions were given before the Commission as to the circumstances in which the cargo of 55 crates containing folidol was loaded, by Dabke as a shipping agent on the one hand, and by Subba Rao—Manager of Chika Private Ltd.—and Nakhate—Plant Protection Technician—on the other. Dabke stated that even though he had taken part both in the import and export on behalf of Chika Private Ltd., on several occasions, he did not know that folidol was a dangerous poison. He claimed that he was a “non-matric” having no knowledge of chemistry, and denied that he had ever read any literature concerning folidol, which was received by his office, though he admitted that the literature had to be supplied to the Customs authorities when folidol was imported from Germany and the literature was demanded by the Customs officers. It was not disputed that the literature similar to the leaflet found attached to the carboys of folidol was required by the Customs authorities, but Dabke stated that his servants used to ask for the literature from the importers without his instructions. He then stated that the Customs authorities made an endorsement on the bill of entry that the importer may produce the requisite literature; that on receiving such a demand from the Customs authorities the clearing agent sent the bill of entry to the importer for complying with the same; and that sometimes the clearing agent intimated to the constituent to send the literature and the clearing agent carried that literature to the Customs authorities. He admitted that for consignments of folidol appropriate literature was demanded on eight or ten occasions by the Customs authorities, and the same was received from Chika Private Ltd., and was supplied to the Customs authorities. He denied that the Customs authorities sent their report through the clearing agent. We, however, admitted that Nakhate, employee of Chika Private Ltd., told one of the Customs officers, when a sample of folidol was being examined, that there was a discrepancy in the description of the goods between the indent, invoice and the licence, and that he was present when the Customs officer told Nakhate to explain the discrepancy between the indent, invoice and licence; but he asserted that no one from Chika Private Ltd., had ever told him that folidol was a dangerous substance and that he should be careful in handling it. Dabke says that he rarely attended the docks, that his employees took the crates from the godown of the Progressive Chemicals Ltd., to the dock and that he had no occasion to see even the crates which were being shipped through his agency. He also denied that he knew that the crates contained poison. In explanation of his conduct in describing the consignment of folidol as “harmless chemical” he stated that he gave that description at the instance of Subba Rao, the Manager of Chika Private Ltd. He asserted that in 1955 when there was export of folidol he had told Chika Private Ltd., that if the goods were dangerous the same would have to be so declared and that he was told by Subba Rao that the cargo of folidol was harmless and that no declaration was necessary.

Subba Rao, Manager of Chika Private Ltd., admitted that he knew that folidol was a dangerous substance. He claimed that instructions were given to Dabke by his Assistant—Nakhate—during his absence, to arrange for export of 55 crates of folidol to Cochin according to the usual procedure followed by his firm. He stated that he was told by Dabke that there was no substance which can be classified as insecticide for shipping purposes, and even though instructions were given to the shipping agents for consigning insecticides by describing them as insecticides, the shipping agents described the cargo as "harmless chemical" and that when the shipping papers describing folidol as "harmless chemical" were received, they thought that the description was not correct. He and his colleagues then had a conference and they thought of describing folidol as "harmless chemical" with the addition of the words "insecticide for agricultural use". Subba Rao claimed that these words were added only for the purpose of shipping classification on 30th May 1956 for the first time. He admitted that except for shipping classification purposes the description "harmless chemical" was wholly an untrue description. He also admitted that when he and his colleagues conferred about the alteration of the description they did not consider the shipping regulations, but copied the description given to the consignments by the shipping agents.

Nakhate, who is an Assistant of Subba Rao in the Plant Protection Department and works as a technician, admitted that he had signed the letter dated 19th March 1958 for the consignment of 55 cases of folidol and had addressed the same to Dabke. He stated that in 1956 it was decided to describe folidol for shipping purposes as "harmless chemical/insecticide for agricultural use", that originally his firm was describing folidol as 'insecticide' and that it was after discussion between him and Subba Rao that the new description was adopted. According to him, instructions were received from Subba Rao to describe folidol as a harmless chemical because folidol "was required to be described for shipping purposes in this manner". He did not look into the shipping regulations to ascertain whether the alteration in the description was correct, but believed that the alteration must have been made because it was so required by the shipping agents. He asserted that he had told Dabke that folidol was a dangerous substance and that it should be carefully handled. According to Nakhate, folidol was a deadly poison, but he regarded it as a harmless chemical for shipping purposes because it was not inflammable, corrosive or explosive, and from the "shipping transport angle" he regarded only those substances which were inflammable, corrosive or explosive as harmless, and folidol not being one of the three categories it was described as harmless. Nakhate attributed to Subba Rao the desire to make a change in the description from insecticide to harmless chemical, and the adoption of the formula "harmless chemical/insecticide for agricultural use" for describing folidol when consigning it by sea.

Subba Rao and Nakhate suggest that at the instance of Dabke they started describing folidol as a harmless chemical, and relied upon the letter written by Chika Private Ltd., to Dabke on 19th February 1955, where in folidol was described as "insecticide". Dabke says that he did not know the properties of folidol, and only described it

as harmless chemical as suggested by Subba Rao. He has relied upon the letters, dated 16th January 1957, 23rd September 1957 and 26th September 1957 written by Chika Private Ltd., in which folidol was referred to as harmless chemical, and upon the letter, dated 30th May 1956 in which the word "insecticide" was scored out in the handwriting of Subba Rao and the expression "harmless chemical" substituted.

Dabke knew that for securing space in a ship for transporting dangerous cargo, a declaration under rule 4 of the Indian Merchant Shipping (Carriage of Dangerous Goods) Rules, 1954, had to be made. His pretension that he did not know that folidol was a poisonous liquid cannot be accepted. Dabke had acted as a clearing agent for Chika Private Ltd., when folidol was received by air from Germany. In the Air Freight Bills folidol was described as poisonous liquid, and there was an express direction that it should be stowed away from foodstuff. Again, Nakhate stated that he had told Dabke in the presence of the Customs Officer when a sample of folidol was submitted that folidol was a dangerous poison and he should be careful in handling it.

We have carefully considered the evidence and the demeanour of Dabke, Nakhate and Subba Rao, and we have no doubt that each of these persons is seeking to shift the burden from his shoulder to that of another with a view to create an appearance that he was an innocent agent in making a false statement which has been one of the contributory causes to this grave tragedy.

In an enquiry of this nature it may be difficult to ascertain the motive of those who were responsible for describing a deadly poison as a "harmless chemical". It was suggested that the false description was made with a view to save freight. The freight for general cargo on the Bombay/Malabar section is Rs. 36 per 40 c.ft.: it is claimed by Krishnan, Assistant Manager of the shipping company, and K. R. Vasavda, Assistant Secretary of the Indian Coastal Conference, and Rasiklal Adachaia, that the freight is computed at double the general cargo rate. According to the evidence of Vasavda, even though there is no separate classification for poisonous insecticides, the rate to be charged for insecticides is double the general cargo rate. The same view has been taken by the Assistant Manager of the New Dholera Steamships, Ltd., Rasiklal. Vasavda has not been able to give any instance in which a poisonous cargo was charged on the Bombay/Malabar route at double the general cargo rate, when the cargo was of a description which was not expressly provided for in the Schedule. Chika Private Ltd., examined one S.T. Bhansali, Assistant Manager of the Scindia Steam Navigation Co. Ltd. He claimed that his company had taken cargo of folidol as "harmless chemical" and had charged only the general cargo rate, and that the entry at page 73 "dangerous cargo and/or explosives non-dangerous as per B.P.T. Bye-Laws" meant that cargo which was dangerous to the ship and the crew only was chargeable at the specified rate. In the Schedule to the Coastal Conference Tariff there appears no specific item dealing with freight to be charged on poisonous cargo on the Bombay/Malabar section, certain named chemicals are set out at page 71 and freight to be charged is specified. At page 88 is a schedule

of rate to be charged for non-dangerous chemicals in bags or casks. It is worthy of note that on the Malabar/Bombay route for dangerous cargo freight is chargeable at a rate exceeding double the general cargo rate (p. 103).

The entry at page 73 read in the light of entry at page 74 prescribing freight for explosives dangerous and explosives non-dangerous, appears to be somewhat obscure.

Bhansali in his evidence claimed that even for poisonous cargo the Scindia Steam Navigation Co. Ltd., charged the general cargo rate. He also asserted that on the ships of the Scindia Steam Navigation Co. Ltd., for chemicals—poisonous or non-poisonous—separate stowage arrangements were made.

Description of poisonous cargo as cargo of harmless chemical is definitely an untrue description. There is in the Conference Schedule no head for "harmless chemical". Why then this description has been adopted? Krishnan, Assistant Manager of the New Dholera Steamships Ltd., says that his company could not have accepted the cargo at the general cargo rate if he had been told that folidol was a dangerous poison. Even Bhansali has stated that if cargo is of a description not expressly referred to in the conference freight schedule, his company normally charges at "unclassified rates"; but if there is difficulty the company contacts the conference and then the rate is settled.

This evidence may, in our view, furnish some clue to the reason for calling folidol as "harmless chemical". Apprehending that a higher freight may be demanded, folidol appears to have been described as harmless chemical.

There may also be another reason. We will presently refer to the rules framed under the Indian Merchant Shipping Act for carriage of dangerous goods which require a shipping company not to accept for transport dangerous goods unless declared in the manner prescribed by rule 4 of the Indian Merchant Shipping (Carriage of Dangerous Goods) Rules. In order to avoid a possible enquiry into the nature of the cargo, and a possible refusal to accept cargo by ships which do not have 'tween decks or special storage facility, this expedient may have been adopted.

SECTION II

The Indian Merchant Shipping Act, 1923, was amended by Act XXIII of 1953. Section 10 of the amending Act amended section 225 of the parent Act. By the amended section it was provided that the Central Government may make rules regulating, in the interests of safety, the carriage of dangerous goods in ships to which the section applies. Sub-section (2) of the amended section is not material. Sub-section (3) states:

"If any of the rules made in pursuance of this section is not complied with in relation to any ship, the owner or master of the ship shall be liable to a fine which may extend to

three thousand rupees and the ship shall be deemed for the purpose of this Part (Part V) to be as unsafe ship."

Under the authority reserved to the Government of India under section 225 of the said Act, by Notification No. S.R.O. 1966, dated 16th June 1954, the Central Government made and published certain rules called the Indian Merchant Shipping (Carriage of Dangerous Goods) Rules, 1954. By rule 2, clause (b), "dangerous goods" were defined to mean any of the good specified in items (i) to (viii) (both inclusive) of sub-rule (1) of rule 4 and to include any other goods of a dangerous character to which the provisions of the rules may, from time to time, be applied by an order of the Central Government. "Explosive" was defined as having the same meaning as in the Indian Explosives Act, 1884. By rule 4(1) it was provided:

"No dangerous goods shall be taken on board any ship to which these rules apply for carriage in that ship, unless the shipper of the goods has furnished the owner or master of the ship with a statement in writing as regards the identity of the goods and the nature of the danger to which the said goods give rise, indicating at the same time to which of the following categories the said goods belong, namely:

- (i)
- (ii)
- (iii)
- (iv) poisons.
- (v)
- (vi)
- (vii)
- (viii)
- (ix)
- (x) other dangerous goods."

By sub-rule (2) it was provided that the master of the ship shall cause a list to be prepared and carried in the ship setting forth, in accordance with the information furnished under the foregoing provisions of the rule, the dangerous goods carried in the ship on the voyage in which she is currently engaged.

Rule 5 provided for the marking of the dangerous goods. It provided, in so far as it is material:

"No dangerous goods, being goods contained in a vehicle, receptacle or package, shall be taken on board a ship to which this rule applies for carriage in that ship unless the vehicle, receptacle or package in which the goods are contained is clearly marked with a distinctive label or stencil purporting to indicate the nature of the danger to which the goods give rise, and if the goods are taken on board the ship at any port in India or with the territorial waters of India, a label or stencil purporting to indicate the identity of the goods."

Rule 6 provided for the packing and carriage in bulk. By sub-rule (1) it was provided:

“No dangerous goods, being goods which are not loaded in bulk, shall be taken on board any ship if from the statement under rule 4 or marking under rule 5 to which this rule applies for carriage in that ship if the owner of the ship or any of his servants or agents knows or could with reasonable diligence have known that having regard to their nature the goods are not packed in a manner adequate to withstand the ordinary risks of handling and transport by sea.”

In this case we are not concerned with sub-rule (2) which deals with loading in bulk.

Rule 7 provided for stowage of goods. It was provided:

“Dangerous goods stated as dangerous goods under rule 4 or marked dangerous under rule 5 and any vehicle, receptacle, or package containing dangerous goods, taken on board any ship to which this rule applies for carriage in that ship shall be stowed in the ship, and shall be kept as stowed, in a manner which is a safe and proper manner of stowage for the goods, or, as the case may be, for the vehicle, receptacle or package having regard to the identity and dangerous nature indicated by the markings referred to in rule 5.”

It cannot be disputed that folidol is a poison and falls within the definition of “dangerous goods” under rule 2(b). Each of the 55 crates of folidol which was loaded on board the ship S. S. Jai Hind on voyage No. 166 bore a stencil mark “poison”. The master of the ship did not call upon the shipper to submit a statement regarding the identity of the goods and the nature of the danger to which the goods would give rise and indicating the category to which the goods belonged. Evidently the master of the ship could not cause to be prepared a list which is required by rule 4(2) to be carried in the ship, setting forth, in accordance with the information furnished, the dangerous cargo carried in the ship. No attempt was also made to ascertain whether with reasonable diligence the master of the ship and the other officers could have known, having regard to the nature of the goods, whether they were packed in a manner adequate to withstand the ordinary risks of handling and transport by sea. Again, the goods were stored indiscriminately with foodstuffs and appear to have been stored in that manner notwithstanding the serious risk of contamination of the foodstuffs. In our view, the provisions of rules 4, 6 and 7 were infringed by the shipping company and the officers of the ship and also by Chika Private Ltd., and their clearing agent. Chika Private Ltd., and their clearing agent have abetted the infringement of rule 4.

It may at this stage be pertinent to refer to certain correspondence which is placed on record. By the letter dated 21st August 1955 from the Principal Officer, Mercantile Marine Department, Bombay District, addressed to all the shipping companies in Bombay, the companies were informed that in order to give effect to the provisions of Regulations 3, Chapter VI, of the International Convention

for the Safety of Life at Sea, 1948, the Government of India had issued rules, under the Indian Merchant Shipping Act (Act XXI of 1923) for carriage of dangerous goods and explosives in the ships from the Indian ports, but these rules did not make provision in detail for the packing and stowage of various types of dangerous goods when carried with other commodities, and for the marking of such goods by distinctive symbols or designs. By the second paragraph it was stated that the Government of India had decided that until such time as the International Regulations providing for a uniform system of packing, stowage and marking of dangerous goods for carriage by sea were adopted, the recommendations contained in the United Kingdom Government Departmental Committee Report on the Carriage of Dangerous Goods and Explosives in Ships, 1951, as amended from time to time, was to be followed, whenever reasonable and practicable, to obtain compliance with the provisions of the Indian Merchant Shipping (Carriage of Dangerous Goods) Rules, 1954.

On page 110 of the United Kingdom Government Departmental Committee Report on "The Carriage of Dangerous Goods and Explosives in Ships" it is stated:

"1. General.

This section (section 4) includes substances which are dangerous by reason of the poisonous or deleterious effect which they have on human beings when they find their way into the body either by being breathed, by being taken through the mouth, or by absorption through the skin.

Only substances whose primary danger is poisoning are included in the section. Poisonous substances which have other more dangerous characteristics are included in the sections dealing with such characteristics. The poisonous compressed gases are also excluded from this section and will be found in section 2.

This section is divided into two groups: (A) substances which give off a poisonous gas or vapour, and (B) other poisonous substances in Group (A), which are generally liquids, danger arises primarily from breathing the gas or vapour; substances in group (B) become dangerous when taken through the mouth and may be either liquids or solids. Certain substances in both groups are also dangerous if absorbed through the skin. In general the precautions required will be similar for the two groups.

The tables also set out any subsidiary hazards which may result from damage to a container or containers.

2. Packing.

The main precautions required are to prevent leakage of the substance or its gas or vapour during the normal usage incidental to transport. In the case of liquids, an adequate air space must be allowed in the containers for thermal expansion; the minimum air space required is shown in the Table.

Packing material may be required:—

- (i) for protective purposes only, or
- (ii) for protective purposes and also for the absorption of liquid in the event of breakage.

In most cases it may be corrugated paper, saw-dust, woodwool or similar material, but in certain special cases as specified in the Tables kieselgur or other approved substances must be used for packing purposes. Where "effective absorbent material" is specified it must comply with the definition of "effective" on pages 5 and 6 and in addition, when two or more containers of a diameter exceeding $3\frac{1}{2}$ inches (90 mm.) are packed in a case, the case must contain an internal partition or partitions, with the object of maintaining the position of each such container in relation to each other such container in the case. All packages must conform to the general principles set out in the General Recommendations (pages 5 and 6).

Where no limit of weight or capacity is specified in the Tables there is no restriction on the weight or capacity of the packages.

3. Stowage.

Generally, substances in this section should be stowed in such a manner as to avoid all risk of contaminating food or foodstuffs.

For liquids giving off poisonous gas or vapour, stowage in a well ventilated space is desirable. Unless otherwise specified, these substances may be carried on or under deck. Any special conditions are shown in the Table.

After discharge, spaces used for the transport of poisonous substances should be properly cleaned and examined before being used for other cargoes, especially food and foodstuffs."

At page 117 the following entries were made:

SECTION 4A—POISONOUS SUBSTANCES

<i>Column No. and head</i>	<i>Details of entries</i>
(1) Substance	PARATHION (Diethyl-p-nitrophenyl thiophosphate) Parathion or liquid containing parathion.
(2) Characteristic properties	Poisonous liquid, should not be inhaled or allowed to come into contact with the skin.
(3) Details of Main or Inner Packing	(1) Glass bottles of suitable make, effectively closed. (2) Tins or cans of suitable make, effectively closed. (3) Suitable metal drums (<i>e.g.</i> , steel) effectively closed.
(4) Minimum Air Space	5% (for all the three types of packing mentioned against column 3).

<i>Col'mn No. and head</i>	<i>Details of entries</i>
(5) Maximum quantity of Substance in Inner Container or Net Weight of contents.	4 oz. (for glass bottles). 2½ pts. (for tins and cans). 100 gal. (for metal drums).
(6) Details of protective or outer packing	(1) Packed with effective absorbent material in wooden cases. Not more than 6 gal. in each case (for glass bottles). (2) Packed with effective absorbent material in wooden cases. Not more than 12 gal. in each case (for tins or cans.)
(7) Maximum gross weight of package allowed.	..
Stowage : (Columns 8, 9 and 10).	
(8) <i>Cargo ships</i> and passenger ships which are certified to carry a number of passengers not exceeding 25 or 1/10th the number of feet in the ship's registered length whichever is the greater.	On or under deck. Away from food, food-stuffs and living quarters (see definition (A), page (5) (for all types of inner packing).
(9) <i>Other Passenger Ships</i>	As for cargo ships (for all types of inner-packing).
(10) <i>Restrictions</i> on stowage in relation to explosives (see p. 53).	7 (for all types of inner packing).
(11) Recommended label or stencil	C (in Appendix C are set out the labels including the label for poison which has not to be less than 4" x 4").

It is evident from the rules, and the letter of the Government of India to the Shipping companies, that the shipping companies were expressly informed about the publication of the Indian Merchant Shipping (Carriage of Dangerous Goods) Rules, 1954, and about the duty of the shipping companies and its officers to comply with the same and also to adopt, as far as possible, the United Kingdom Government Departmental Committee Report on the Carriage of Dangerous Goods and Explosives in Ships, 1951.

It is evident that the shipping company and the clearing agents did not make the requisite declaration under rule 4 of the Indian Merchant Shipping (Carriage of Dangerous Goods) Rules; the cargo of folidol crates was not packed in the manner prescribed by the United Kingdom Government Departmental Committee Report and the crates were stowed together with foodstuffs, and as a result of the breaches of statutory obligations contamination of the foodstuffs was facilitated.

According to Subba Rao, the Manager of Chika Private Ltd., the company was unable to obtain in India the requisite aluminium containers for bottling folidol processed in India. He stated that for about two years attempts were made for trying different types of containers and ultimately a polyethylene container was selected by one Bernhardt, representative of Bayers, as entirely suitable for storage and transport of folidol. According to Subba Rao, polyethylene is "almost indestructible" and precautions were taken to

prevent any possible leakage from the polyethylene container. He stated that smaller containers of 100 cc. and 1000 cc. capacity were heat-sealed and thereafter screw-caps were fixed in position. The 15 litre containers were stoppered with a screw-cap, which, when fixed in position, prevented leakage, and to ensure against possibility of leakage after filling up the carboys they were rolled on the floor in a horizontal position and were left for 48 hours, and thereafter only they were despatched. Subba Rao, however, admitted when asked by the Commission, that the only tests made by Chika Private Ltd., on polyethylene containers were for ascertaining the tensile strength of the carboys filled and unfilled, and no tests were made by him to ascertain the chemical reaction of folidol on the body of the carboys and the screw-caps.

The claim that polyethylene is almost indestructible is belied by the circumstances in which the screw-caps of 15 litre containers were found. Some of the screw-caps of the 55 carboys were broken into pieces; in others there were extensive cracks and through those cracks the liquid had oozed out and in the case of one carboy the carboy itself appeared to have severely dented on the side. It is not possible to state when this damage to the screw-caps, which were also made of polyethylene occurred; but there can be no manner of doubt that the polyethylene carboys could not be said to be indestructible as claimed by Subba Rao. There is nothing to show that there was anything but a normal handling of the carboys during the voyage.

Mr. Punwani, Technical Director of Bright Brothers, Ltd., was unable to state how damage to the screw-caps occurred. According to Punwani, the material out of which the carboys were fabricated was not defective. Gidwani, the Sales Manager of Bright Brothers, Ltd., stated that Chika Private Ltd., had not told his firm that the carboys were required to store folidol, that he did not know what the components of folidol were, and that without knowing the components of folidol his firm could not have ascertained whether folidol had a deleterious effect upon polyethylene.

Alkathene which is the raw material for manufacturing the carboys is obtained by Bright Brothers Ltd., from Imperial Chemical Industries (India) Ltd. The suppliers have issued a brochure which sets out the properties of alkathene. There is a passage in the brochure which is of particular importance:

“Environmental Cracking of Stressed Alkathene.—While organic polar liquids are little absorbed by ‘alkathene’ at normal operating temperatures, they have an apparently embrittling effect under certain operating conditions. This type of failure has been variously termed “environmental cracking”, “solvent cracking” and “stress cracking”. The phenomenon is associated with a complex stress system, and liquid or vapour contact. Unstressed ‘alkathene’ does not crack in an active environment. It has been shown that at strains less than about 10 per cent. no failure generally occurs with the normal commercial grades of ‘alkathene’, provided the surface of the specimen is free from flaws. This statement refers to the

uniaxial type of stressing obtained as in a tensile test. If, however, there is a multi-axial system of stress, fracture of the component may occur at very low elongations. This apparent embrittlement is closely related to grade number and the lower the grade number, the less the effect. It is, of course, difficult to predict the performance of 'alkathene' with mixtures containing organic liquids, but a standard test exists which can show how some mixtures compare with liquids of known behaviour. The test evolved by the Bell Telephone Laboratories in the U.S.A. and generally referred to as the B.T.L. Test, consists of bending a number of standard slotted specimens and inserting them in the liquid. These specimens, when bent, have high stresses of complex distribution and the time taken for them to fracture is a measure of the aggression of the liquid or alternatively, the resistance of the 'alkathene'. It is unwise to generalise regarding the use of 'alkathene' with organic liquids since function, size and other variables can completely dominate the problem....."

The cracking of screw-caps of 15 carboys on voyage No. 166 of 'S.S. Jai Hind and thereafter was, in our view, due to this environmental cracking. The suppliers Bright Brothers Ltd., were never given any specifications of carboys, nor were they asked to guarantee that the carboys and the caps will not be corroded or cracked by storage of folidol. There was practically no investigation made by Chika Private Ltd., as to the reaction of different grades of alkathene in contact with folidol, liquid and vapour

Again it is clear that the recommendations made for packing in absorbent material were also ignored. The carboys were packed in crates which contained straw only.

We are, therefore, of the view that Chika Private Ltd., and V. V. Dabke, their shipping agent, made false statements as to the true nature of the consignment and thereby induced the shipping company to accept a consignment at general cargo rate, which the shipping company would not have otherwise accepted. We are also of the view that Chika Private Ltd., adopted methods of storage and packing, which are not sanctioned by the United Kingdom Government Departmental Committee Report on the Carriage of Dangerous Goods and Explosives in Ships, and which were faulty.

CHAPTER III

FOOD POISONING CASES IN THE KERALA STATES

Between 13th April 1958 and 23rd May 1958, 1,031 cases of food poisoning were reported in the State of Kerala. The cases are broken up below district-wise. The statement shows the number of persons affected by illness and the number of persons who died on account of food poisoning.

<i>Name of district</i>	<i>No. of persons affected</i>	<i>No. of persons died</i>
Trivandrum	202	16
Quilon	180	65
Alleppey	40	Nil
Kottayam	15	Nil
Ernakulam	183	20
Trichur	185	7
Palghat	39	Nil
Kozhikode	180	Nil
Cannanore	7	Nil
TOTAL	1,031	108

In the State of Madras also it was reported that two cases of food poisoning had occurred in the district of Trichinopoly. These cases were reported to have occurred on 30th April 1958. Also on 30th April 1958 in Chingleput there was a wedding feast, and 31 persons, who partook of the food served at the feast, developed symptoms of food poisoning, and one out of them died. But before the Commission no evidence has been led about the incidents of food poisoning in the State of Madras because the cases of food poisoning had no direct connection with the source of contamination of food stocks which occurred in the Kerala State and with the investigation of which primarily this Commission is concerned.

The cases of food poisoning may be taken up in chronological sequence. The first set of cases were reported on 13th April 1958 in the village of Vadakkekara in Ernakulam district. About midday on 13th April 1958, 12 persons were taken ill with food poisoning. Out of these 12 persons two recovered and ten died between the

hours of 4 P.M. and 8-30 P.M. on that day. The names of the persons who died are:

- | | |
|---------------------------------|----------------|
| (1) C. Damodaran | Aged 60 years. |
| (2) V. V. Joseph | Aged 9 years. |
| (3) K. Thangappan | Aged 18 years. |
| (4) Madhavan | Aged 16 years. |
| (5) Anandan | Aged 11 years. |
| (6) Sukhumaran | Aged 15 years. |
| (7) Sadashivan | Aged 19 years. |
| (8) Sashi | Aged 6 years. |
| (9) Vishvam | Aged 4 years. |
| (10) V. Pillai Pillai | Aged years. |

It appears that all these persons become ill after eating bread or bun prepared in a village bakery belonging to one Menon, from Anchor Brand maida which was purchased on 10th April 1958 by the owner of the bakery. The witnesses who were examined in connection with this set of cases were Dr. Thomman, Poullose, Ravi—son of Damodaran, Kunjan—the tea-shop keeper who supplied bread, Mrs. Thresia—mother of Joseph, Velayudam Vaidyan—father of Thangappan, Madhavan and Anandan, Parvati—mother of Sukhumaran, Keshavan—father of Sadashivan, and Appu Velayudam—father of Sashi and Vishvam. The illness developed so suddenly that it was believed by the villagers to be either due to cholera or to “radio-activity”, and in some cases as a result of “black magic”. Sub-Inspector of Police C. S. Raman Pillai attached to the police station at Monambam went round the houses in which the dead bodies were lying, but on account of the opposition of the villagers he did not take any steps to make an inquest on the dead bodies, nor did he arrange to send the dead bodies for post-mortem examination. Even the food and the vomited material were not attached by him and he did not make any investigation. It was on 10th May 1958 that Sub-Inspector C. S. Raman Pillai recorded the cases (Crime Nos. 26 to 29 of 1958) under instructions from his superior officers. Witness Poullose stated that one Damodaran took coffee and a bun from the shop of one Kunjan and that Damodaran died shortly thereafter. Ravi—son of Damodaran—stated that his father returned home from the bazaar at about 5 P.M. on 13th April 1958 and lay down for some time and expired. At that time, Damodaran was frothing from the mouth and the nose and saliva was oozing out and he was also shivering, and was unable to tell his son Ravi what the cause of his illness was. Thresia—mother of Joseph—stated that her son Joseph, who was about ten years old, purchased two “loaves of bread” from the shop of one Gopalan and after eating one of them he started frothing from the mouth and died shortly thereafter. According to Thresia, Joseph complained of giddiness. She stated that the other bread was given to one person named Pylamma, who also ate it and died. Velayudam

Vaidyan stated that his three children—Thangappan, Madhavan and Anandan—went to the tea-shop of Kunjan and took tea and bread, that the youngest son Anandan started feeling giddy and the other boys started to bring him home, that the other two children also fell down on the road and the neighbours brought them to his house, that the two boys died on the way and the third died after he was brought home; that froth was oozing out from the noses of all the three boys and that the bodies were yellowish in colour. Kunjan, the shop-keeper, stated that on 13th April 1958 he had purchased “buns” from the tea-shop of one Gopalan and that he had given three loaves to one Velayudam Vaidyan, three more to one Kanakkan and one loaf to Damodaran and one to Sukhumaran. He stated that Damodaran had eaten the loaf (bun) in his tea-shop and that on the next day he came to learn that Damodaran had died. Parvati stated that her son Sukhumaran had purchased on 13th April 1958 a loaf of bread and that he had returned home at about 1 p.m. and at that time froth was oozing out from his mouth. The witness stated that the froth was yellowish in colour and that shortly after returning home Sukhumaran died. She also stated that Sadashivan also died in similar circumstances. Keshavan—father of Sada-shivan—stated that on 13th April 1958 he came to learn that his son had eaten “bread”, that thereafter he was brought home ill, that at the time when he was brought home Sadashivan was not in a position to speak, that froth was oozing out from his mouth and his limbs were shaking and that he vomited once and died shortly after he was brought home. Appa Velayudam stated that his sons Sashi and Vishvam purchased bread from Gopalan’s shop, that both of them ate the bread, that Sashi vomited once, that both the boys showed symptoms of illness about half an hour after eating bread, that both the boys complained of headache and spoke in a low voice, that they had shivering and convulsions and that he suspected that they were suffering from the effect of “black magic”. Appa Velayudam called a physician who prescribed some medicine, but both the boys died within a short time after they became ill. V. Gopalan stated that he was dealing in bread, biscuits, buns and rusks, that these were prepared in his shop by his employees, that he purchased $\frac{3}{4}$ maund of flour from the shop of Simon William Almeida on 12th April 1958, that some bread was prepared out of the flour purchased by him and that he had sold 10 loaves of bread to the neighbouring shop and the remaining bread was attached by the Health Inspector and the Panchayat Officers. We may observe that the witnesses have indiscriminately used the expression “bun” or “bread” to describe what in reality were rusks. The evidence of Keshavan shows that each loaf of bread cost only one anna. Simon William Almeida, who is a resident of the village of Pallipura, stated that on 10th April 1958 he purchased three bags of maida from the shop of John Thomas Porthookkaren of Mattancheri and that he sold $\frac{3}{4}$ maund of maida to V. Gopalan of Vadakkekara and that he sold half a maund of this maida to one Rajan on 13th April 1958 and one pound of maida to a neighbour. The witness stated that his neighbour after consuming a preparation of maida fell ill, and that thereafter he informed Rajan that the food prepared out of the maida sold by him should not be sold. He then stated that on 16th April 1958 the Health Inspector came to his shop and took

samples of the maida and that the remaining maida was kept in the shop after sealing it up.

Dr. Thomman, who was Joint District Medical Officer at Trichur in April 1958, stated that he received information from the Medical Officer that ten persons had died in Monambam of cholera. Apprehending that these casualties were due to cholera, Dr. Thomman, accompanied by the District Medical Officer, went to Monambam and contacted the medical officer in charge of the local hospital. In the local hospital he saw two persons who had taken ill and from enquiries Dr. Thomman learnt that the cause of illness could not be cholera. The patients reported to Dr. Thomman that every patient felt giddy and emitted saliva from the mouth and nose and that every one felt uneasy in his stomach and suffered from convulsions. The patients also reported that they had taken bread from a bakery and had eaten the same. Dr. Thomman stated that no post-mortem examination was made on any of the dead bodies because the dead bodies had been cremated. Dr. Thomman also did not come to learn whether any stomach-wash was given to the victims or the vomited material was collected and sent for chemical examination. He further stated that the symptoms exhibited by the patients who died and by the persons who survived were the same.

Sub-Inspector C. S. Raman Pillai of the Munambam Police Station received a report on 14th April 1958 at about 7-00 A.M. about sudden deaths in the village of Vadakkekara as a result of cholera, and he proceeded to the village and made an enquiry. Raman Pillai stated that Ravi—son of Damodaran—told him that his (Ravi's) father had died of heart failure. The Sub-Inspector then came to learn that three persons—M. Pillai, Sukhumaran and Sadashivan by name—had also died suddenly. He proceeded to Machanturuttu. He was informed by the mother of Sukhumaran that her son had died on account of radio-activity and that at the house of Velayudam Vaidyan he was informed that two children had died on account of black magic. Sub-Inspector Raman Pillai was of the view that the death had taken place on account of cholera. Having come to learn that all the persons who had died had suffered illness on account of eating "bread" purchased from the shop of Gopalan, he posted a constable to guard the baker's shop and then proceeded to the house of M. Pillai and thence to Kunhitaye where he learnt about the death of three more persons. These three persons were Thangappan, Madhavan and Anandan—sons of Velayudam Vaidyan. Velayudam reported to the witness that he did not know the cause of death of his children. Sub-Inspector Raman Pillai wanted to hold an inquest on the dead bodies but a large crowd of 400 persons assembled and he was forcibly prevented from holding an inquest. The witness admitted that he had only recorded the statement of one Velayudam and that he did not record any other statements but made entries in his diary about the observations made by him. Even after 14th April 1958 Sub-Inspector Raman Pillai did not record any statement till he registered a formal complaint on 10th May 1958. It appears that this officer showed a little weakness in the

discharge of his duties as a police officer. He should have insisted upon performing the inquest upon the dead bodies and secured post-mortem examination.

The symptoms exhibited by the ten persons who died and the two persons who had been treated in the hospital were the same, and it appears that all the twelve persons had suffered illness from a common source of contamination, viz., food eaten by them from the shop of Gopalan. On the evidence, there can be no manner of doubt that all these persons had taken "bread" purchased from the shop of Gopalan. It is true that there is no post-mortem examination of any of the dead bodies, nor have even inquests been held on the dead bodies by Sub-Inspector Raman Pillai. It appears, however, that the Health Inspector Kunju Krishnan Menon visited the bakery of Gopalan and took samples of the food prepared and flour and seized the entire stock. The report of the public analyst shows that parathion, a poisonous organic polyphosphate used as an insecticide, was indicated in the samples of biscuits, rusks and flour but not in the bread sent for examination.

The wheat flour from which the biscuits, rusks, etc., were prepared is shown to have been received from out of the consignment of flour received on 1st April 1958 by S.S. Jai Hind on voyage No. 166. Meghji Malsi Private Ltd., of Cochin had sold 15 bags of maida to John Thomas Poruthookkaren & Brothers on 7th April 1958 and an invoice in that behalf is produced. It appears from the bill of John Thomas Poruthookkaren & Brothers that on 10th April 1958 three bags of maida were sold to Simon William Almeida of Pallipura, and that Simon William Almeida sold $\frac{3}{4}$ maund of maida to Gopalan of Vadakkekara on 12th April 1958 and also one maund of maida to one Rajan on 13th April 1958. Simon William Almeida has stated that the maida sold by him was discoloured but the bags were not discoloured.

From the evidence of Mulchand M. Shah, Director of Meghji Malsi Private Ltd., it appears that he had received a consignment from Bombay of maida by S.S. Jai Hind on voyage No. 166, and out of these 150 bags, he had taken delivery of 100 bags from the godwons of the Malabar Steamship Co. Ltd., and of the remaining 50 bags delivery was given directly to the customers from the steamer agent's godown, and out of these 50 bags, 15 bags of maida were delivered to John Thomas Poruthookkaren under the invoice dated 7th April 1958. From the Export General Manifest prepared in the Bombay Port, and the tally-sheets, it appears that these bags of maida were stowed in hatches Nos. 3 and 4 of S.S. Jai Hind.

On the evidence of Mulchand M. Shah, John Thomas Poruthookkaren, Simon William Almeida, Kunju Krishnan and Gopalan, it is established that the maida which was used for manufacturing the rusks, buns, biscuits and bread was out of the consignment received by S.S. Jai Hind on voyage No. 166 and that it was contaminated by parathion. The symptoms of illness which have been spoken to by the witnesses are symptoms similar to those which are exhibited as a result of eating food contaminated by parathion. Even in the absence of any post-mortem examination or the examination of any

stomach contents or vomited material, it is not difficult to arrive at the conclusion that ten persons whose names have been set out died in the village of Vadakkekara on 13th April 1958 as a result of consuming foodstuff made out of maida which was contaminated by folidol either on board S.S. Jai Hind on voyage No. 166 or during transit from the ship to the godowns of the Malabar Steamship Co. Ltd., or in the godowns of the Malabar Steamship Co. Ltd. The illness of the other two persons who survived is also traced to the same source.

The next incident is reported to have occurred on 19th April 1958. Two children—Hari, son of Krishna Menon, aged 3 years, and Govindan, son of Ranganathan, aged 7 years, died soon after taking tea sweetened with sugar obtained from the shop of one K. C. Anthony. The two children were residing with their respective parents in the village of Poolithura in the Ernakulam district. These two children and eight others took tea sweetened with sugar and fell ill. Hari died at about 7 P.M. on 19th April and Govindan died on the next day at about 7 A.M. The other eight persons survived after treatment in the local hospital.

Thangamma, mother of Govindan, stated that her son died at about 7 A.M. on 20th April 1958. She stated that on 19th April 1958 she had purchased from the shop of one Anthony one pound of sugar and had, on 20th April, prepared tea and sweetened it with that sugar, that tea so prepared was taken by herself, her child Govindan and a stranger, that all the three persons who partook of tea fell ill and that Govindan died at 7 A.M. on that day. According to Thangamma, five minutes after the child took tea it became unconscious and showed symptoms of shivering and giddiness and the child was unable to speak and was, therefore, removed to the hospital at Tirupunithura. She stated that four spoons-full of sugar were put into the tea which was prepared for three persons, that the taste of the tea was bitter, that she herself felt shivering and giddy and purged and that she felt pain in her limbs. According to Thangamma, the other persons who partook of tea also suffered from purging, felt giddy and vomited.

Raman Menon, uncle of Hari, stated that at about 10 A.M. on 19th April 1958 Hari had taken tea sweetened with sugar, that about an hour thereafter Hari felt uneasy and became unconscious, that Hari then vomited and had motions and was then given ginger juice sweetened with sugar, but that treatment having proved ineffective, Hari was taken to the Government Hospital at Tirupunithura and that the child died at about 7 P.M. According to Raman Menon, sugar used for sweetening tea and ginger juice was purchased from K. C. Anthony's shop. The witness stated that nine persons had taken tea and it was sweetened only with a small quantity of sugar and the rest of the sugar was thrown away as Hari fell ill. He stated that the other members of the family who took tea did not suffer any illness or discomfort.

Varkey Devassy, salesman in the shop of K. C. Anthony at Tirupunithura, had in April 1958 sold sugar to Thangamma and Raman Menon and that sugar was sold from out of one of 16 bags of sugar purchased from Mookan Devassy Ouseph & Sons on 7th

April 1959. These 16 bags of sugar purchased on 7th April 1958 were wet and the bags were in double packing. Varkey Devassy had purchased another lot of 10 bags on 14th April 1958 but that was in single packing indicating that it was received by rail. Out of the total number of 26 bags, contents of 13 bags were sold, and two whole bags and some loose sugar out of the bags purchased on 7th April and ten bags purchased on 14th April remained in the shop and the same were surrendered to the police. Varkey Devassy says that there was no change in the colour of the sugar or in the coverings and at the time when delivery was taken the sugar did not give out any foul smell. He admitted that the contents of all the 16 bags were wet and that he had been charged lower rate because the sugar was wet.

Head Constable Philipose registered information about the death of the two children—Govindan and Hari—and recorded the statement of Hari's father on 19th April 1958 at about 10 P.M. and also the statement of Venkatesan, Govindan's brother, and then held an inquest on the dead bodies of Hari and Govindan, and seized 107 lbs. of loose sugar and 12 bags full of sugar from K. C. Anthony's shop. He stated that the bags of sugar appeared to him to be wet and emitted foul smell, that a Mahoyar was prepared, that the 12 bags of sugar seized by him were in double packing, that the 107 lbs. of sugar were also in double packing, that samples were sent to the Chemical Analyser from the loose sugar as well as from the bags and that the report of the Chemical Analyser in this behalf was received. He stated that there was slight, though not appreciable, discolouration of the sugar because it was wet. He further stated that all the 12 bags and the samples which were taken from them were dry and not wet, but the coverings were wet.

The report of the Chemical Analyser to the Government of Kerala, on examination of the sugar samples taken from the sugar attached from Anthony's shop is produced. It is certified that parathion—a poisonous organo polyphosphate used as insecticide—was indicated in a sealed bag containing a sample of white crystalline substance stated to be sugar, but parathion was not detected in a sealed bundle containing 12 sealed packets stated to be of sugar samples.

Dr. R. K. Panikkar, Assistant Surgeon at Tiruppunithura Hospital, conducted post-mortem examination on the dead bodies of the two children Hari and Govindan. The observations recorded by him showed that there was a slight congestion of both the lungs and the lips were cyanosed and the hands and feet were blue. In the opinion of Dr. Panikkar death was due to poisoning. Dr. Panikkar sent the Viscera to the Chemical Analyser and the Chemical analyser reported that no parathion was detected in the viscera and the contents. Dr. Panikkar says that Hari had muscular contractions, severe perspiration and was making incoherent utterances and had difficulty in breathing, and that Govindan was vomiting and had a high pulse rate and high temperature and died in convulsions. From the symptoms Dr. Panikkar suspected food poisoning as the cause of the death of the two children. Dr. Panikkar also admitted ten other persons in the hospital who had symptoms "more or less similar to the symptoms" exhibited by Govindan and Hari. Dr. Panikkar suspected that the symptoms were similar to symptoms of arsenic

poisoning. One of the ten patients examined in the hospital showed symptoms of cedema of the lung and the patient was, therefore, transferred to the general hospital. On enquiry from the patients and their relations Dr. Panikkar came to learn that the common source of poisoning was sugar purchased from the shop of K. C. Anthony. Dr. Panikkar wrote to the local Sub-Inspector of Police that the common source of the substance which caused illness appeared to be sugar sold from the shop of K. C. Anthony and that steps be taken to avoid further contamination and spread of illness.

It is evident that the stock of sugar which contaminated tea which resulted in the illness of twelve persons was from the stock sold by Mookan Devassy Ouseph & Son on 7th April 1958.

Mookan Devassy Ouseph & Son had imported 100 bags of sugar, from Jos Thomas, Bombay, in the month of March 1958, and the consignment was received by S. S. Jai Hind on voyage No. 166. Delivery was taken by L. Chakunny—manager of the firm—of one bag on 3rd April and of the remaining 99 bags on 4th April 1958 from the godown of the Malabar Steamship Co. Ltd. Out of this lot of bags 16 bags were sold by L. Chakunny to K. C. Anthony of Tirupunithura on 7th April 1958. L. Chakunny has produced the invoices for purchasing the goods and also a copy of bill for sale of 16 bags of sugar to K. C. Anthony.

It is clear on the evidence that the contaminated sugar which was used for sweetening tea was out of the stock received by S. S. Jai Hind on voyage No. 166. Undoubtedly the chemical examination of the viscera did not disclose the presence of parathion. But that, in our view, cannot be regarded as decisive. It appears from the evidence that parathion is not absorbed in the body tissue and is thrown out by vomiting and in the excretions, and also when the patient's stomach is washed. The symptoms exhibited by the two children and by the ten other persons who had fallen ill simultaneously after taking the tea prepared with sugar obtained from K. C. Anthony were the same symptoms and the sample of sugar out of a part of the bag which was sent for chemical examination showed contamination by parathion. In our view, the evidence clearly shows that some out of the 14 bags which had been disposed of by K. C. Anthony were contaminated by parathion. The death of the two children Hari and Govindan and the illness of the other ten persons must, therefore, be regarded as attributable to taking tea with sugar contaminated by folidol. The sugar sold from K. C. Anthony's shop to Thangamma and Raman Menon was out of the sugar received by S. S. Jai Hind on voyage No. 166. It appears from the Export General Manifest and the tally sheets that the bags of sugar were stowed in hatch No. 1 of S. S. Jai Hind on 27th March 1958 between 9-15 A.M. and 9-34 A.M., in which hatch also folidol crates were stowed on the same day between 11-2 A.M. and 11-9 A.M.

The third incident occurred on 22nd April 1958. On that day in the village of Ezhikkara, district Ernakulam, and within the limits of North Parur Police Station, ten persons were taken ill with food poisoning. Two out of these died. They were Radha, aged two years, and Ratnagaran, aged six months.

Kumaran, who runs a tea shop in the village of Ezhikkara, purchased some biscuits from one Joseph on 22nd April 1958, and he gave some of these biscuits to two children. These two children were Radha and Ratnagar. After eating the biscuits the two children began to weep and started coughing and perspired profusely. Thereafter the children started frothing from the mouth. The children were removed to the hospital and stomach-wash was given. But both the children died shortly after they were taken to the hospital. The remaining biscuits were seized by the health authorities.

Kaushalya—mother of Ratnagar—also stated that after her child took 1/3rd of a biscuit which was given by Kumaran the child showed symptoms of illness and was removed to the hospital. She also stated that she had taken one biscuit and as a result thereof she suffered from convulsions and giddiness and was unable to speak and her vision was blurred and she was treated for eight days in the local hospital.

Joseph, the vendor of the biscuits, stated that he had purchased one maund of maida from the shop of one Natarajan of Pallipura on 19th April 1958 and had baked biscuits in the bakery of one Augustin out of that maida and out of those biscuits he sold 50 biscuits to Kumaran on 25th April 1958. The witness sold biscuits in the villages of Reddikara, Chathanar and Kadamakar.

Rajan, a resident of the village of Pallipura, had purchased a maund of flour from one Simon Almeida on 13th April 1958 and had also prepared biscuits at Augustin's bakery but he did not sell the same because he was asked by Simon not to sell them. Rajan threw some biscuits to a cat and the cat died after eating the biscuits.

Augustin, who was the owner of the bakery at Pallipura, was accustomed to hire out his bakery to persons who desired to use it for baking biscuits, and accordingly Rajan had baked biscuits on 14th April 1958, and Joseph had baked his biscuits on 20th April 1958. Augustin asked Rajan not to sell the biscuits because he was informed about the death of some persons by eating biscuits. Augustin says that the bakery was not used by any one between 14th April and 20th April 1958; and after the flour, which was required for preparing the biscuits, was kneaded on the table, the table was not cleaned before letting it out to another person. Augustin says that he destroyed the biscuits of Rajan on 18th April 1958, and that when Joseph came to his factory for baking his biscuits, Rajan's biscuits were not in the factory, but he did not notice whether the table on which the flour was kneaded was cleaned.

William Almeida of Pallipura had purchased 3 bags of maida from the shop of John Thomas Poruthookkaren of Mattancheri on 10th April 1958 and he sold half a maund of maida to Rajan on 13th April 1958 and one pound to a neighbour of his. When his neighbour prepared food out of the maida and ate it he and some other persons fell ill. On coming to know of this illness, witness Almeida informed Rajan that preparations made from the maida should not be sold. On 16th April 1958 the health inspector went to the shop of Almeida

and took samples of the maida and sealed up the remaining maida. According to William Almeida, the maida was discoloured.

Kunju Krishna Menon, Health Inspector of Parur Taluka, received information about two persons having died in the village of Ezhikkara, and went to the shop of Joseph of Pallipura and took samples from the shops from which the bread was purchased and sealed the shops. The samples were sent to the Public Analyst for chemical examination. The report of the Public Analyst shows that parathion was detected in roasted bread but no parathion was detected in the biscuits and rusks. An inquest was held on the dead bodies of the two children by Sub-Inspector U. P. R. Menon and the dead bodies were sent for post-mortem examination to the Government Hospital at Parur. Dr. Kunjamma Thomas, who performed the post-mortem examination on the two bodies, could not find out the cause of death and she, therefore, sent the viscera for examination to the Chemical Analyser. Dr. Kunjamma did not find any fluid in the lungs of the dead bodies and she stated that the colour of the dead bodies was normal. From the Chemical Analyser's report it appears that the results of the post-mortem examination were negative for parathion.

The two children Radha and Ratnagarar died shortly after eating the biscuits purchased by Kumaran from the hawkker Joseph. Joseph had purchased one maund of maida from the shop of Natarajan of Pallipura. Natarajan had purchased one maund of flour from E. C. Mamu & Co. There is no evidence that this flour was from the stock of S. S. Jai Hind. But from the evidence of Augustin, the owner of the bakery, it is clear that the contamination took place in his bakery, the biscuits baked by another customer named Rajan having been found to be contaminated. It is true that Rajan had baked his biscuits on 14th April 1958 and Joseph baked his biscuits on 20th April 1958. But according to Augustin no one else had baked biscuits between 14th and 20th April and the possibility of the biscuits baked by Rajan and Joseph being mixed up cannot be ruled out. There appears to have been considerable delay in sending the viscera of the children for examination and some delay also in holding the chemical examination. From the report of the Public Analyst it appears that the bread seized from the shop of Joseph of Pallipura was contaminated by parathion.

Almeida had sold 3/4th of a maund of flour to Rajan. Almeida in his turn had purchased 3 bags of maida from John Thomas Poruthookkaren, and John Thomas Poruthookkaren had purchased Anchor Brand maida from Meghji Malsi Private Ltd. It is true that Joseph had sold the biscuits in three villages and there does not appear to be any evidence of illness as a result of consumption of biscuits purchased from him by any other person. It is also noteworthy that Joseph has referred to the baking of biscuits by him and the biscuits have not been found to be contaminated, whereas bread was found to be contaminated. There is again some obscurity as to the manner in which the contamination is alleged to have taken place. The flour purchased by Joseph was, it appears, not from the stock of S. S. Jai Hind, and the contamination, it is suggested, took place by baking biscuits in the same bakery in which Rajan baked his biscuits. In view of the obscurity of the evidence, it may

not be possible definitely to hold, especially having regard to the negative report of the Chemical Analyser for contents of the viscera, that the two children Radha and Ratnagarán died as a result of parathion poisoning.

The next incident also occurred on 22nd April 1958. In the village of Trichur there is a boarding establishment known as "Ladies' Lodge". One Bharati, aged about 43 years, was a resident in that lodge. One Chirakutti, a servant employed in the Ladies' Lodge, purchased 3 lbs. of rava from the shop of one Kittu at Trichur on 21st April 1958 and prepared 'uppuma' out of that rava. The 'uppuma' was eaten by six persons—Shriranjani, Bharati, Gomati, Devyani, Emily Simon and Kochamu. Kochamu was a servant employed in that lodge and the other five were residents of that lodge. Chirakutti reserved her portion of 'uppuma'; but when she knew that the members of the lodge who had eaten the 'uppuma' suffered serious illness, she threw away her portion.

There were 7 residents in the Ladies' Lodge. The residents of the lodge had prepared on 22nd April 1958 'uppuma' from rava purchased by the servant Chirakutti from the shop of Kittu and after taking the 'uppuma' six members of the lodge including Bharati became ill. Gomati, one of the inmates, who was examined, stated that she was bedridden and she perspired profusely and felt giddy. Chirakutti has spoken to the symptoms exhibited by the members of the lodge. She stated that the members of the lodge after eating the 'uppuma' perspired profusely and were unable to speak or even to take water, and that Bharati was unconscious. Kochamu who took a portion of the 'uppuma' stated that she started having convulsions and vomiting after eating the 'uppuma' and that her vision was blurred. Out of the six persons who fell ill on account of eating 'uppuma' five were treated in the Trichur hospital and recovered after treatment; Bharati died at about 9 P.M. on 22nd April 1958.

Sub-Inspector Parameswaran held an inquest on the dead body of Bharati and sent it for post-mortem examination. He also recovered 1½ lbs. of rava from the Ladies' Lodge and sent it for chemical examination. He also attached 5 bags of rava from Mane & Co. and samples of the same were sent for chemical examination. Dr. K. K. Thamburan, who performed the post-mortem on the dead body of Bharati, submitted his report. He preserved the viscera and sent it on 19th May 1953 to the Chemical Analyser. The Chemical Analyser has certified that parathion was detected in the rava taken from the Ladies' Lodge, but parathion was not detected in the bags of wheat flour and in the viscera.

Kittu says that his servant had sold 3 pounds of rava on 21st April 1958 to a servant employed in the Ladies' Lodge from rava purchased by him on 19th April 1958 from Mane & Co. C. V. Anthony, servant of Kittu, was the person who purchased the rava from Mane & Co. He produced the bill from Mane & Co. He also stated that he sold 3 lbs. of rava to Chirakutti, servant in the Ladies' Lodge. Kochappan, who is the Manager of Mane & Co., Trichur, had stated that he purchased from the Wallace Flour Mills, Ltd., Bombay, 25 bags of suji (rava) and 75 bags of wheat flour, and that the consignment was received in the first week of April. From the Export

General Manifest and the tally-sheets it appears that bags of rava were stored in hatch No. 1 of S. S. Jai Hind on 27th March 1958. Kochappan says that out of the 25 bags of suji 18 bags were sold to different persons and that he had sold 15 lbs. to Anthony, employee of Kittu.

From the evidence of Kittu, Anthony and Kochappan, and the documents produced it is clear that the rava, which was used for preparing 'uppuma' in the Ladies' Lodge, was received by S. S. Jai Hind on 1st April 1958. It is true that the viscera shows no signs of parathion contamination. But Gomati has stated that Bharati was given a stomach-wash immediately after she reached the hospital. The contents of stomach do not appear to have been sent to the Chemical Analyser and there appears to have been considerable delay in the sending of the viscera, which was kept in spirit during the interval. The absence of parathion detected in the viscera is not, for reasons already set out, sufficient to justify an inference that the death was not due to parathion poisoning. The presence of parathion in the balance of rava which was attached, and the symptoms exhibited by Bharati and the other persons who fell ill simultaneously after eating the 'uppuma' sufficiently indicate that there was a common source of food-poisoning and that common source was the rava.

The next incident occurred on the 23rd and 24th of April 1958. 8 persons fell ill in the village of Korattikara within the limits of Kumbakonam Police Station, after eating 'uppuma' or some other preparation from suji which was purchased from one K. Varid. Out of the 8 persons who fell ill, six died and two, viz., Chakkappan and Krishnan Kutti, recovered after treatment. The persons who died were:

- (1) Infant son of Narayan Kutti, aged 3 months.
- (2) Laxmi, wife of Chakkappan, aged 43 years.
- (3) Subramanyam, son of Chakkappan, aged 12 years.
- (4) Katyayani, daughter of Chakkappan, aged 9 years.
- (5) Bhargani, daughter of Chakkappan, aged 3 years, and
- (6) Parameswaran Nambudiri, aged 16 years.

Narayan Kutti stated that his child, 3 months old died about an hour and half after it was given a preparation of rava purchased from the shop of one Varid of the village of Palni. Narayan Kutti gave the balance of the rava remaining with him to one Chakkappan at the latter's request. Chakkapan's wife prepared 'uppuma' from the rava obtained from Narayan Kutti and all the members of Chakkappan's family fell ill as a result of eating that 'uppuma'. The child of Narayan Kutti, after taking the preparation made from rava, became giddy, had convulsions and started purging and also frothing from the mouth.

Chakkappan, who was one of the five persons who fell ill, stated that he had received one pound of rava from Narayan Kutti and he had prepared 'uppuma' out of the same. A few minutes after eating the 'uppuma' his daughter Katyayani felt giddy and thereafter his wife Laxmi started vomiting and his son Subramanyam also felt giddy. He also stated that he himself felt giddy but he was not

completely unconscious. His son Krishnan Kutty was also taken to the hospital and both of them were treated in the hospital. Describing the symptoms of his illness, Chakkappan stated that his "eyesight was affected", that he saw things much magnified and that he could not move his tongue and could not talk but that he had no difficulty in breathing nor had he any frothing from his mouth.

Varid, who sold rava to Narayan Kutty, had purchased 30 pounds of rava from Mane & Co. on 19th April 1958. He had also sold one pound of rava to one Vasudevan Nambudri and 3 pounds of rava to one P. M. Vasudevan, and the remaining rava was produced before the police. Varid produced the cash memo in respect of the rava purchased on 19th April 1958. Mane & Co., Trichur, had ordered out rava and flour from the Wallace Flour Mills Ltd., Bombay, and out of the consignment received in the first week of April 1958, the balance which remained after sale was taken over by the Health Inspector. Chakunni, Health Inspector of Vadakkancheri, attached on 29th April some foodstuffs from the house of one Kittappa, 'uppuma' prepared out of rava from the house of Chakkappan, and rava from the shop of C. K. Varid of Palni and directed Varid not to sell the remaining rava. The samples of 'uppuma' and rava were sent to the Chemical Analyser for examination. The Chemical Analyser reported that no 'uppuma' was received from the police, but the sample of rava seized was found positive for parathion.

Dr. M. P. M. Mambiar, Civil Surgeon of Kunnankulam, Government Hospital, stated that he treated Chakkappan and his son. He stated that Chakkappan was "intensely collapsed" and had nausea and pain on the lower back and cold sweats and was in a dazed condition of mind. Krishnan, son of Chakkappan, had also frothy discharge from his nose and had diarrhoea. Both Chakkappan and his son were given treatment and were discharged from the hospital on 2nd May 1958. Dr. Mambiar was unable to ascertain the cause of illness.

It appears that the dead bodies of Laxmi, Subramanyam, Katya-yani and Bhargani were disposed of and no post-mortem examination could be made. The dead body of the infant son of Narayan Kutty was also disposed of.

Parameswaran Nambudri was the sixth victim in that village. Vasudevan Nambudri purchased one pound of rava from the shop of Varid on 24th April 1958 and prepared 'uppuma' from that rava on the next morning. 12 persons in his house ate that 'uppuma'. After eating the 'uppuma' his brother Parameswaran Nambudri, who was about 16 years of age, felt giddy and profusely perspired. One Dr. Pai from Kunnankulam was called but Parameswaran died before the doctor arrived. There was no ill-effect on the other persons who had taken 'uppuma'. It is stated that Parameswaran vomited and also passed stools and was frothing from the mouth. Parameswaran developed symptoms of illness about an hour after eating 'uppuma'. Vasudevan says that a large portion of the 'uppuma' was eaten by Parameswaran. It is, of course, a surprising circumstance that out of the 12 persons who had taken 'uppuma' in the house of Vasudevan Nambudri Parameswaran alone fell ill

and died. There is no medical evidence about the post-mortem or examination of the viscera of Parameswaran. But from the similarity of the symptoms exhibited by Parameswaran and the other persons who died, viz., the son of Narayan Kutti and the members of Chakkappan's family, and having regard to the circumstance that the illness was the result of taking food prepared from rava obtained from a common source, an inference easily arises that contaminated rava was responsible for the death of all these six persons and that rava was contaminated, according to the Chemical Analyser's report, by parathion. It appears that information about the death of the six persons in the village of Korattikara was received by the police on 27th April 1958 and an offence was registered on that day.

The next incident took place in the village of Ankamali in the district of Ernakulam on 24th April 1958, in which three persons died. These three persons were Babu, aged 2 years, Rusie, aged two months, and an infant son of Narayan Nair, about 7 months old. All these three persons died as a result of taking coffee, milk and sago sweetened with sugar. Information in connection with these deaths was registered as late as 10th May 1958 by K. Chakrapani, Station Officer.

On 24th April 1958 two children were taken to the Little Flower Hospital at Ankamali. One child died before it reached the hospital and the other was in a dying condition. Dr. Joseph, who examined the children, found that the pulse of the living child could not be detected. The child was unconscious and the history given to him was that the two children had taken milk in the morning and when they were playing together they developed symptoms of illness and he was told that the children had fainted. Dr. Joseph stated that from the condition of the children nothing could be made out, and he was unable to find out the cause of death. The parents of the children took away the dead bodies and Dr. Joseph did not give information to the police because he had no suspicion about the cause of death. The two children who were treated by Dr. Joseph and who died in the hospital were Babu and Rusie. According to Dr. Joseph, the pupils of both the children were contracted and he did not suspect that the death was due to poisoning.

Dr. Punnan is a private practitioner in Ankamali. On 24th April 1958 an infant died shortly after it reached the dispensary of Dr. Punnan. The pulse of the child could not be detected and the child was gasping for breath and was frothing from the nostrils. The child died about 20 minutes after it was brought to the dispensary. In the view of Dr. Punnan, the child died on account of pulmonary edema but he could not, from the symptoms shown by the child, say what precisely was the cause of pulmonary edema. Dr. Punnan did not report the death to the police.

In this case, no inquest has been held and there has been no post-mortem examination. No samples of the milk, which is alleged to have been taken by these children, or the sugar with which it was sweetened, have been taken. No evidence of any other relatives of the children has been led. It would be difficult to hold that these

three children died as a result of parathion poisoning, though, it may be observed, that the symptoms shown by these children were similar to those exhibited by patients who had eaten food contaminated by parathion.

The next incident took place on 25th April 1958 in the village of Murukkumpuzha in the district of Trivandrum within the limits of the Kazakuttam Police Station. On that day 66 persons were admitted to the Ullur hospital, and five of them died. They were Soman, aged 4 years, son of Krishnan Janardhan, Hanifa Bibi, aged 8 years, niece of Mahamad Kunju, Michael Fernandez, aged 13 years, son of Mattachan Fernandez, Stalin, aged 2½ years, son of Jacob Fernandez, and Mahamad Rafi, aged 4 years.

One Syed Kassim and his brother Syed Ibrahim used to go about selling a preparation called "Semiya Payasam" made of maida flour with spices, jaggery and cocoanut milk. On 24th April 1958, Syed Kassim purchased 3½ lbs. of maida from the shop of one Bhargawan and prepared 'Semiya Payasam'. Syed Kassim and his brother Syed Ibrahim went about selling 'Semiya Payasam' on the 25th of April 1958 in the villages of Pudukurichi, Murukkumpuzha and Perunguzhi. Syed Kassim sold 'semiya payasam' between the hours of 9-30 A.M. and 11-30 A.M. Soon after eating 'Semiya Payasam' several persons fell ill. Syed Kassim had prepared about 80 cups and he had sold 'semiya payasam' to about 40 persons. Syed Ibrahim sold about 20 to 28 cups.

Mattachan Fernandez stated that his son Michael, 13 years of age, died on 25th April 1958 after eating a cup of 'semiya payasam' purchased from Syed Kassim. Michael started frothing from the mouth and his pupils were contracted and he vomited and purged. Michael was removed to the Ullur Medical Hospital immediately but he died at about 3-30 P.M. Stalin, son of Jacob Fernandez, who was two years and six months old, fell ill at about 12 noon after eating a cup of 'semiya payasam'. Stalin developed symptoms of illness at about 1 P.M. He started frothing from the mouth and vomited and purged. His pupils were contracted and were red in colour. Stalin was taken to the hospital at Ullur but on the way he died. Hanifa Bibi, who was 8 years of age, died of eating 'semiya payasam' purchased from Syed Ibrahim. She developed symptoms of giddiness, purging, vomiting and profuse perspiration one hour after eating 'semiya payasam'. She was taken to the Medical College Hospital and was given treatment but she died shortly reaching the hospital. Soman, son of Krishnan Janardhan, aged 4 years, drank 'semiya payasam' purchased from Syed Ibrahim at about 10-30 A.M. on 25th April 1958 and within half an hour thereafter suffered from profuse perspiration, purging, vomiting and frothing from the mouth. Soman was removed to the hospital at about 1-30 P.M. and died half an hour thereafter. Mahamad Rafi, aged 4 years, was given 'Semiya Payasam' purchased by his uncle Abdul Rahman from Syed Ibrahim at about 11-30 A.M. on 25th April 1958. Half an hour after eating 'semiya payasam' Mahamad Rafi became unconscious after vomiting and purging. His eyes were red and he started frothing from the mouth. He was taken to the hospital but died shortly after

admission into the hospital. Kuttan Gopalan purchased 'semiya payasam' from Syed Kassim and ate it. He felt giddy and his vision became blurred and he started frothing from the mouth and he was admitted into hospital at 3 P.M. and remained in the hospital for three days. He felt pain in the stomach and he was feeling very weak. He had also difficulty in breathing.

Dr. Anand Lakshmi, who was the Assistant Surgeon attached to the S.A.T. Hospital at Trivandrum, conducted post-mortem on the dead bodies of Soman and Hanifa Bibi. She sent the viscera of the two children to the Chemical Analyser for examination. She stated that she attended to as many as 28 patients who were admitted into the hospital. A majority of the patients were children; they were drowsy, and some of them were vomiting and purging and others had difficulty in breathing. She stated that all the children admitted to the hospital showed similar symptoms. The children were given stomach-wash and injections of glucose and coramine and those children who had difficulty in breathing were given oxygen treatment. Dr. Anand Lakshmi thought that the illness was due to food-poisoning but she could not ascertain the source of poisoning. She was told by the people who brought the children to the hospital that the children had developed the symptoms after taking 'payasam'. Even though the children were vomiting and had diarrhoea, which could account for food contamination, in the view of Dr. Anand Lakshmi, bacterial infection could not be ruled out. Some of the children were noticed to have contracted pupils; some had cyanosis and some had twitching movements. As all the children were given stomach-wash immediately there was no frothing from the mouth of any of the children. Dr. Anand Lakshmi was unable to determine the cause of death of the children who died.

The report of the Chemical Analyser shows that in the samples of 'semiya payasam', which were forwarded by Dr. Anand Lakshmi on 28th April 1958, parathion was detected, but no parathion was detected in the samples of semiya. The viscera of Soman sent by Dr Anand Lakshmi was found to be positive for parathion. The viscera of Michael Fernandes, Stalin, Mahamad Rafi and Hanifa Bibi forwarded from the S.A.T. Hospital were found negative for parathion. Sub-Inspector U.N. Subramanyam registered case No. 59 of 1958 on 26th April 1958. On 25th April 1958, having come to learn that 66 persons had been admitted into the S.A.T. Hospital, he gave intimation to the Circle Inspector and rushed to the hospital and attached the 'semiya payasam' sold by Syed Kassim, which was brought by one of the patients and sent the same for chemical examination. He also attached a sample of the maida from the shop of Bhargawan and sent the same for chemical examination. He also sealed the bag of maida and sent the same for chemical examination by the Chemical Analyser. From the report of the Chemical Analyser it appears that parathion was detected in the 'payasam'. It appears that the Health Assistant, Thonnakkal, had on 25th April 1958 taken possession of the 'semiya payasam', flour and jaggery used in preparing the 'semiya payasam', and sent samples of the same to the Chemical Analyser. The report of the Chemical Analyser shows that parathion was detected in the 'payasam' and the flour but no parathion was detected in the jaggery. Another

set of samples from a bag of flour and some jaggery were also sent to the Chemical Analyser. The sample from the bag of flour was found to be positive for parathion but no parathion was detected in the sample of jaggery.

Bhargawan is a provision shop-keeper near the Murukkumpuzha railway station. He sold 3½ lbs. of maida to Syed Kassim from a bag of maida purchased by him from one S.D.K. Parameswaran Pillai of Chalai. Bhargawan purchased the bag from Parameswaran Pillai on 15th April 1958 and sold 20 to 24 lbs. to different persons. The balance was attached by the police and the same was sent for chemical examination. From the evidence of Subramanyam, accountant of S. D. K. Parameswaran Pillai of Chalai, it appears that Parameswaran Pillai had, through his agent N. N. Konar of Cochin, imported 15 bags of maida from Naishadkumar & Co., Bombay, and that the consignment arrived in the Cochin Port by S.S. Jai Hind on voyage No. 166. Out of this one bag was sold to T. V. Narayanswamy Reddiar of Karamana on 10th April 1958, and the other bags were sold to different persons. From the evidence of Bhargawan, Subramanyam and N. N. Konar, who was the clearing agent of S. D. K. Parameswaran Pillai, and the documentary evidence produced by these witnesses, it is clear that the 3½ lbs. of maida which was used by Syed Kassim for preparing 'semiya payasam' was out of the consignment which was received by S.S. Jai Hind on voyage No. 166 on 1st April 1958. From the Export General Manifest and the tally sheets it appears that these maida bags were loaded in batches Nos. 3 and 4.

The next incident is the one which took place on 29th April 1958 at the Lok Sahayak Sena Camp at Sasthankotta in the district of Quilon. As many as 200 persons fell ill due to food poisoning, and 65 of them died. 30 persons died in the Quilon hospital, 22 at Kadampanad, 12 at Chavarah and 1 at Mevallikkara.

On 10th April 1958 the L.S.S. camp was started at Sasthankotta at a distance of about 15 miles from the town of Quilon. The recruitment for the camp started on 7th April and 525 persons volunteered. There were three companies on the camp, each company being commanded by a junior jamadar. The three companies were known as A, B and C companies. Jamadar Rajamanickam commanded the A company, Jamadar Eticulam commanded the B company and Jamadar Raman Nair commanded the C company. The camp was set up near the Sasthankotta lake. Normally the catering arrangement of the camp is carried with the provisions received from the Army Supply corps, but as the rail-head at which supplies could be received was at a distance exceeding 20 miles, the Madras Area Commander permitted the Commanding Officer to purchase the provisions locally. One K. Gopala Pillai who was recommended as the supplier of provisions supplied 15 bags of atta according to the requisition made by the senior J.C.O. The practice of ordering of provisions was that the store clerk used to place orders for the quantity required. The supply was supervised by the senior J.C.O. and when the supply was received at the camp the Commanding Officer Captain Wilson inspected the provisions received for quality. and after the inspection was over, all goods were stored in a godown reserved for that purpose. Three kitchens were set up, one for each

company, for cooking food. Each kitchen had four cooks. The provisions which were required for meals from lunch to breakfast the next day used to be issued at about 9 A.M. and they were kept in the kitchen to be used as and when required. One Lunger havaldar drew the ration from the store room, and the havaldar used to be accompanied by a cook. Each company used to keep its ration in its kitchen. For the lunch and dinner on 28th April 1958 and for breakfast on 29th April provisions were drawn at 9 A.M. on 28th April 1958. It appears that breakfast was prepared at about 3 A.M. and was distributed to each company at about 8 A.M. after the morning parade.

On 29th April 1958, Captain Wilson went to his quarters to have his breakfast after the usual parade. Some time thereafter one of the volunteers came running to him and reported that a child had taken ill and was being removed to the medical inspection room. Captain Wilson went to the medical inspection room, and some trainees ran up and showed him a dead crow and stated that the crow had died after eating the poories which were issued to the B company. Captain Wilson then ordered that the poories should not be eaten. He then went to the medical inspection room No. 9. At that time about six trainees came with a complaint of giddiness and sensation of vomiting. Immediately Captain Wilson procured a truck to bring the camp doctor from Kadambam. Another truck was sent to Quilon for fetching other doctors. One Dr. Kurian came shortly thereafter. In the meantime, a large number of trainees came to the medical inspection room frothing from the mouth and having convulsions. Dr. Kurian advised evacuation of the trainees to the nearest hospital. About 30 trainees were sent to the Kadambam hospital. As more trainees complained of illness, other arrangements were made for securing vehicles and as vehicles were procured the trainees were sent to different hospitals. Captain Wilson himself had an attack of giddiness and heaviness in the head. He was attended to by Dr. Kurian. On being informed at about 11 A.M. that Jamadar Rajamanickam had also fallen ill, Captain Wilson immediately provided a lorry for removal of Jamadar Rajamanickam. The B company trainees complained to Captain Wilson that the poories eaten by them had a bitter taste. Two persons from the A company who had tasted poories from the B company also stated the same thing. At about 12-30 noon Captain Wilson was removed to the hospital in a semi-conscious condition. He was discharged from the hospital after treatment after about a week.

It appears that poories were made in the camp from equal quantities of atta and maida. On 28th April 1958, the B company was issued atta from a fresh bag. 15 lbs. of atta were issued from that bag to the B company. It appears that atta was not locally available in Quilon and as it was required by Captain Wilson, the local contractor Gopala Pillai, who had arranged to supply provisions to the camp, had gone to Cochin and purchased a large number of bags of atta. Captain Wilson stated that because he had taken poori with sugar it did not taste bitter to him but he had vomiting and choking sensation and he had slight pain in the stomach. Forty-one of the trainees who were removed to the hospital died. It appears that two members of the military personnel—Jamadar Rajamanickam who was the commandant of A company and Narayan Pillai—died.

Three camp attendants including a dhobi, and 19 children from the villages roundabout also met with an untimely death. These children, it appears, were accustomed to watch the parade from some distance. They were normally unable to enter the camp site, but on the fateful day when the poories were found to be tasting bitter, a large number of trainees threw them about. When there was a rush towards the medical inspection room on account of the illness of several trainees, the guard which is normally posted round the camp was removed and the children rushed in and collected the poories, took them home and 19 of them died after eating those poories. It appears that a part of the food was also taken by the camp followers. The following is the list of 65 persons who died in the various hospitals on 29th April 1958:

1. Raju.
2. Gopalan.
3. Krishnan Kutty.
4. Bosque.
5. Pius.
6. Sadanandan.
7. Raghavan.
8. Bhaskaran.
9. Cyrilamma.
10. Edison.
11. Anthony.
12. Marykutty.
13. Sreedhara Panikkar.
14. Abdulsalam.
15. Jerone.
16. Lakshmanan.
17. Rajappan.
18. Chellappan.
19. Krishnan Kutty.
20. Perumal.
21. Jamadar Rajamanickam.
22. Narayan Pillai.
23. K. N. Ramachandran Pillai.
24. M. Abraham.
25. P. Anirudhan.
26. N. Sivaraman Nair.
27. C. T. Abraham.
28. N. Thankappan Nair.
29. A. M. Gopalakrishnan.
30. P. Eappachan.
31. P. K. Oomen Tharakan.
32. Memmen P. Mathew.

33. D. John Kutty.
34. T. S. Thomas.
35. N. Sreedharan Pillai.
36. Ramachandran Pillai.
37. V. Sankaran Pillai.
38. M. J. Koshy.
39. K. Janardhanan Unnithan.
40. V. Pachu Pillai.
41. V. Gopalakrishna Pillai.
42. K. T. Chellappan.
43. Sukumara Pillai.
44. P. S. Samuel.
45. Y. Daniel.
46. K. Bhaskaran.
47. P. Damodaran Pillai.
48. K. John Mathew.
49. Gopinadhan Nair.
50. Cherian Joseph.
51. N. Sekharan Nair.
52. V. Sreekrishnadas.
53. A. Thomas Rajan.
54. V. Vikraman Nair.
55. C. R. Gopalakrishna Pillai.
56. A. Balachandran Nair.
57. Radheyam Nair.
58. P. John.
59. V. Purushothaman.
60. K. Narayanan Nair.
61. V. Indrasenan.
62. C. T. George.
63. S. Appu Achari.
64. Sudalaimuthu.
65. V. Kutty.

Out of these 65 persons, the first 19 are children, Nos. 20, 63 and 64 are camp attendants, Nos. 21 and 22 are military personnel and the remaining 41 were L.S.S. trainees.

One of the persons who died was Jemadar Rajamanickam, commandant of A company. It appears that some of the trainees of the B company complained to him that the poories supplied to them were tasting bitter. In order to verify the truth of the statement made to him, Jemadar Rajamanickam picked up a poori out of the poories prepared for the B company and ate it. He fell ill some time thereafter and was removed to the hospital where he died. It appears

that some monkeys had eaten the poories which were thrown away and those monkeys also died. Some crows also picked up the poories and the crows also died. The poories which were prepared in the three kitchens were prepared from equal quantities of maida and atta. The provisions were issued by the stores clerk Alexander in the presence of the senior J.C.Os. The poories were prepared by the cook and each trainee was supplied three poories. It is pertinent to note that none of the persons who partook of the food prepared in the kitchens of A and C companies suffered any illness. Alexander, the stores clerk, has produced the register maintained by him. From that it appears that on 7th April 1958, 990 lbs. of maida was received in the camp from Gopala Pillai and that maida was issued on the 7th, 14th and 23rd April 1958. It also appears from the entry made on 28th April 1958 that 15 lbs. of atta and 15 lbs. of maida were issued to the B company. From the evidence of Alexander it is clear that there were no other provisions in the camp except those which were supplied by Gopala Pillai.

P. S. Krishnan Nair was the cook attached to the B company on 29th April 1958. He and two other persons prepared poories for the B company. Krishnan Nair stated that the stores for preparing the food had been received on the previous day. He also stated that 15 minutes after the trainees took the poories all of them fell ill. Nair himself tasted a sample of the poori and felt giddy. Thereafter he took some pepper water and had motions and he recovered on the next day. He has stated that there was no insecticide in the cook-house and that he did not notice any discolouration in the maida supplied or in the atta.

K. Gopala Pillai stated that he had purchased 15 bags of wheat flour from C. L. V. Brothers, Cochin, 15 bags of Rani Brand maida from Mookan Devassy Ouseph & Son and 10 bags of wheat pollard from Meghji Malsi Private Ltd., and he had supplied the provisions to the Sasthankotta camp out of the stocks purchased from C. L. V. Brothers, Mookan Devassy Ouseph & Son and Meghji Malsi Private Ltd., and that he had no other atta or maida which could be supplied to the L.S.S. camp. Gopala Pillai had returned 10 bags of atta to C.L.V. Brothers, Cochin, but as C.L.V. Brothers did not take delivery of the same, the Tahsildar seized them. According to Gopala Pillai, there was no discolouration in the maida received from C.L.V. Brothers, Mookan Devassy Ouseph & Son and Meghji Malsi Private Ltd.

Dr. Ooman was on duty in the Quilon Hospital on 29th April 1958. On that day, he received several patients from the L.S.S. camp in the hospital with symptoms of food-poisoning. Dr. Ooman was informed by some trainees of the camp that there were several serious cases in the hospital. Dr. Ooman went to the hospital and saw that there were two dozen cases and that some persons were actually dying and some were very serious. Most of the patients had difficulty in respiration and complained of giddiness, staggering gait, high temperature, diarrhoea and general weakness; some complained of pain in the abdomen and some had vomited and felt uneasy. Serious cases had frothing discharge from the mouth and noses. On that day 78 persons were admitted to the hospital out of whom

7 died. 23 dead bodies were also brought to the hospital. From the symptoms it appeared to Dr. Ooman that the cause of death was food-poisoning. The stomach contents of the persons who died in the hospital were collected and sent for chemical examination.

Dr. T. V. Surendranath, Assistant Surgeon in the Quilon Hospital, stated that several cases of food poisoning were admitted in the hospital on 29th April 1958 and that he had, as a medical officer, observed the patients and their symptoms. According to Dr. T. V. Surendranath, every patient complained of general weakness and giddiness and some complained of pain in the stomach; serious cases had frothing from the mouth and some had vomited and 4 or 5 persons were purging. In some cases the patient complained of blurred vision. The patients did not complain of pain in the chest. The pupil of some of the patients were found dilated. Dr. Surendranath performed the post-mortem examination on the dead body of Jamadar Rajamanickam and he sent the viscera for chemical examination. The symptoms of the living patients noted by Dr. Surendranath were practically the same and from the history given to him he thought that the cause of illness was food-poisoning but he was unable to ascertain the nature of the poison.

Mohamad Hasan, District Superintendent of Police attached to the Quilon Sub-Division Police Station, having come to learn about the tragic incident, rushed to the Quilon hospital along with the Circle Inspector and the Sub-Inspector of Police. He gave the necessary directions for inquests on the dead bodies. He then proceeded to the L.S.S. camp, looked into the kitchen and the store-house, prepared a Mahazar and drew samples of all the items of foodstuffs and sent the same for chemical examination. The Chemical Analyser's report shows that out of the 15 items of food articles sent by the First Class Magistrate, Adoor, such as dough, dough balls, atta flour, puri, etc., parathion was detected only in three items. Similarly it was reported that three poories taken and forwarded by the Medical Officer, Government Dispensary, Kadambanad, on 6th May 1958, were found positive for parathion. It was further reported that out of 4 items of empty gunny bags used for storing maida, atta, sugar, etc., which were forwarded by the First Class Magistrate, Adoor, on 7th May 1958, parathion was detected on two bags. Similarly it was reported that out of the 12 items of food articles like poori, cocoanut oil used for preparing puri, sugar, atta, etc., forwarded on 7th May 1958 by the District Collector, Quilon, parathion was detected in poori, cocoanut oil used for preparing puri, and in the atta samples. The examination of the contents of the viscera of Jamadar Rajamanickam, forwarded by the Assistant Surgeon T. V. Surendranath, District Hospital, Quilon, on 30th April 1958, showed positive results for parathion. Seven specimens of stomach-wash forwarded by the Resident Medical Officer, District Hospital, Quilon, on 1st May, 1958, were all found to be negative for parathion. Material vomited by a victim in the L.S.S. camp which was forwarded by the Medical Officer in charge of Kadambanad Hospital on 6th May 1958 was found to be negative for parathion.

It appears that some of the samples taken from the L.S.S. camp were sent to the Chemical Examiner to the Government of Madras.

By his report, dated 12th May 1958, addressed to the District Collector and Additional District Magistrate, Quilon, the Chemical Examiner to the Government of Madras certified that out of the 12 samples, two samples—one marked atta and containing some brownish white powder and another marked poori and containing some fried edible—were positive for parathion. It was stated in the report that parathion was found in the atta in a quantity not less than 160 milligrams and in the poori in a quantity not less than 240 milligrams. In the other articles such as fresh cocoanut oil, oil used for preparing poori, potato, sugar, tea, salt, milk powder, chilly, “masala” and corn flour, no parathion was detected. 13 other samples were also sent to the Central Forensic Science Laboratory at Calcutta for chemical examination, and on examination it was found that the samples of cocoanut oil, poori, potatoes, milk powder and empty gunny showed contamination by parathion. The poori had .15 per cent., cocoanut oil used for preparing the poori had .053 per cent., atta had .01 per cent. and empty gunny bag had .0153 per cent. contamination by parathion. The “masala” also showed a trace of parathion poisoning. The remaining articles, viz., sugar, tea, chilly, salt and corn flour, showed no contamination by parathion. About the “masala”, in which trace of parathion was found, it was advised that it should not be consumed. Poori and cocoanut oil used for preparing poori were declared to be highly poisonous; atta and the empty gunny bag were declared to be poisonous.

Dr. N. K. Iyengar, who is the Director of the Central Forensic Science Laboratory at Calcutta, under the Central Home Ministry, stated that he had received certain samples for chemical examination and that he had made his report. In the samples he found considerable quantity of parathion. Similarly he received another letter dated 29th May 1958 enclosing certain samples and he submitted his report thereon.

The provisions which were supplied to the L.S.S. camp were supplied by Gopala Pillai. Gopala Pillai himself had, in his turn, purchased atta and maida from Mookan Devassy Ouseph & Son, C.L.V. Brothers and Meghji Malsi Private Ltd. From the evidence of the representatives of these three firms it is clear that the provisions which reached Gopala Pillai were received by S.S. Jai Hind on voyage No. 166. The atta and maida consigned to Meghji Malsi Private Ltd., C.L.V. Brothers and Mookan Devassy Ouseph & Son were stowed in hatches Nos. 1, 3 and 4 of S.S. Jai Hind. The evidence of the stores clerk Alexander and the cook P.S. Krishnan Nair clearly establishes that there was no possibility of parathion contamination after the provisions were received in the camp. The evidence, therefore, clearly establishes that the parathion which was found in the various samples of foodstuffs was as a result of contamination in the course of voyage No. 166 of S.S. Jai Hind or thereafter when the cargo was discharged or unloaded from the ship into the godown of the Malabar Steamship Co. Ltd.

The next incident took place also on 29th April 1958 at the village of Karamana, district Trivandrum. 64 persons were admitted to the General Hospital at Trivandrum, and 7 others died before they were

7 died. 23 dead bodies were also brought to the hospital. From the symptoms it appeared to Dr. Ooman that the cause of death was food-poisoning. The stomach contents of the persons who died in the hospital were collected and sent for chemical examination.

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The next incident took place also on 29th April 1958 at the village of Karamana, district Trivandrum. 64 persons were admitted to the General Hospital at Trivandrum, and 7 others died before they were

brought to the hospital. Out of the 64 persons four died in the hospital. The persons who died are:

1. Appu Kuttan.
2. Rajagopalan Nair aged 14 years.
3. Bahadur Shah aged 26 years.
4. Abdul Ashraf aged 6 years.
5. Ramdas aged 24 years.
6. Shahul Hamid aged 18 years.
7. Chellappan aged 14 years.
8. Gopal Kumar aged 3½ years.
9. Hari Krishnan aged 2½ years.
10. Vishwambharan aged 6 years, and
11. Shanmugam aged 23 years.

All these persons were reported to have died, and the remaining persons fell ill on account of partaking of banana fritters and 'modakam' from Ambika Vilas Hindu Hotel at Karamana, conducted by one Madhavan Pillai. The wheat flour required for the preparation was purchased from T. V. Narayanswami Reddiar. Madhavan Pillai, the proprietor of the Ambika Vilas Hindu Hotel, purchased 4 lbs. of maida from the shop of T. V. Narayanswami Reddiar. Madhavan Pillai then prepared banana fritters and 'modakam' out of the maida. The banana fritters and the 'modakam' were sold in the village of Karamana, and as a result of consuming the banana fritters and 'modakam' 71 persons fell ill. Appu Kuttan, who was a servant employed in the shop of Madhavan Pillai, ate some banana fritters and he started frothing from the mouth and had profuse perspiration. Appu Kuttan was unable to speak. He was removed to the dispensary of Dr. Keshavan Nair and thereafter to the General Hospital and he died. Bahadur Shah, brother of Mohideen M. Abdulla, ate some banana fritters purchased on that day at about noon from the Ambika Vilas Hindu Hotel and he fell ill within two hours thereafter. He started frothing from his mouth and had burning sensation in his lungs. Bahadur informed his brother Mohideen that he had taken banana fritters from the Ambika Vilas Hindu Hotel. Bahadur was taken to the dispensary of Dr. Keshavan Nair. He died on the way to the dispensary of Dr. Keshavan Nair. Abdul Ashraf, son of Mohideen, also died after he took banana fritters from the Ambika Vilas Hindu Hotel. Ramdas, nephew of Subbaya Chettiar, took tea and banana fritters from the Ambika Vilas Hindu Hotel. He then started suffering from shivering, vomiting and contraction of pupils. Ramdas was removed to the hospital and he died at about 2 P.M. One Shahul was found by his cousin Sultan Pillai coughing and frothing from the mouth. Shahul was also suffering from burning sensation and vomiting and he had profuse perspiration and was unable to talk. Sultan Pillai came to learn that Shahul had taken banana fritters and tea at the Ambika Vilas Hindu Hotel. Shahul died in the hospital on that day. One Chellappan also purchased banana fritters worth eight annas and took them home. The banana fritters were eaten by three persons—Chellappan, Rosama and Rosama's daughter. Soon thereafter all the three started frothing from the mouth and they had vomiting sensation and giddiness. All

the three were taken to the General Hospital. Chellappan died, but Rosamma and her daughter recovered. One Pankajakshi proceeded from her village to her brother-in-law's house at Karamana. On her way she purchased from the Ambika Vilas Hindu Hotel banana fritters worth twelve annas. She gave the banana fritters to Gopal Kumar—son of Chellappa (her brother-in-law), Vishwambharan—her own son, and one Hari Krishnan—a neighbour's son. The banana fritters were also eaten by one Voyamma, sister of Chellappa. Some time thereafter all the persons who had eaten the fritters started frothing from the mouth, perspired profusely and started coughing and felt giddy. Gopal Kumar, Hari Krishna and Vishwambharan died at about 7 P.M. at the General Hospital to which they were removed. Rajagopalan Nair also died in the hospital. The other three persons—Pankajakshi, her father and Voyamma—recovered after treatment.

One Shanmugam also partook of banana fritters from the Ambika Vilas Hindu Hotel at Karamana. Saraswati, widow of Shanmugam, stated that her husband died on 29th April 1958 after taking tea and banana fritters from the Ambika Vilas Hindu Hotel, that thereafter her husband was brought home from the hotel, that he was then vomiting and frothing from the mouth and had cyanosis and was unable to speak, that Shanmugam was taken to the hospital at about 3 P.M. and at about 4 P.M. he died. Post-mortem was performed on the dead body of Shanmugam by Dr. Lilamani. Dr. Lilamani sent the stomach contents with heart, lung, spleen, liver, kidney and portions of the brain of Shanmugam for chemical examination. The report of the Chemical Examiner shows that parathion was detected in the viscera and contents.

Madhavan Pillai is the proprietor of the Ambika Vilas Hindu Hotel at Karamana. His servant Raghavan Pillai purchased 4 lbs. of maida from the shop of T. V. Narayanswami Reddiar. From the maida Madhavan Pillai prepared banana fritters and 'modakam' and sold the same to several persons in the village. Rajaram Pillai, who is the salesman of T. V. Narayanswami Reddiar, stated that he had sold 4 lbs. of maida to Raghavan Pillai, servant in the Ambika Vilas Hindu Hotel, out of a bag of maida which was purchased from Parameswaran Pillai on 10th April 1958. It appears that the remaining maida was seized by the police on 29th April 1958. T. V. Narayanswami Reddiar had purchased 15 bags of maida from Parameswaran Pillai of Cochin. Subramanyam, the accountant of S. D. K. Parameswaran Pillai of Chalai, produced the invoice in respect of the purchase of maida imported by his employers from Naishadkumar & Co. of Bombay through his clearing agent N. N. Konar. S. D. K. Parameswaran Pillai had purchased 15 bags of maida and out of that one bag was sold to T. V. Narayanswami Reddiar on 10th April 1958 and the bill for the same has been produced by Subramanyam. S. D. K. Parameswaran Pillai had also sold the remaining bags to the various persons whose names were set out in the list produced by Subramanyam.

Dr. Lilamani, who was the Assistant Surgeon attached to the General Hospital at Trivandrum, stated that 73 cases were admitted to the hospital on 29th April 1958, that the patients had different symptoms, that some of them complained of giddiness, nausea and vomiting, some of profuse diarrhoea and some of giddiness only, that froth mixed with blood was coming out from the mouths of some

of the patients, that some of the patients had informed her that they had taken sugared coffee or rice with 'sambar', that some patients reported that they had taken 'dosai' and 'idli' and that all the patients stated that they had taken the various foodstuffs from a shop at Karamana. Dr. Lilamani suspected that the illness was due to food-poisoning, but in her view the symptoms did not conform to any known food-poisoning. She noticed that some of the patients who were children had pin-point pupils and some had pulmonary edema and most of the patients had nausea, purging and vomiting.

Ten samples of maida, atta, etc., were sent by the Sub-Inspector of Police, Fort Station, Trivandrum, on 7th May 1958, and parathion was detected only in one sample of maida, that sample being of maida remaining after sale for use in the Ambika Vilas Hindu Hotel, Karamana, which was obtained from the shop of T. V. Narayanswami Reddiar. No parathion was detected in the other items.

Nine samples of maida and eleven samples of sugar were forwarded by the Sub-Inspector of Police, Fort Station, Trivandrum, on 6th May 1958, but no parathion was detected in any of the samples. 16 items of food articles were forwarded by the Food Inspector, East, Trivandrum Corporation, on 29th April 1958, and the sample which was described as 'modakam' alone was found to be positive for parathion.

Sub-Inspector Bhuvanendra Nair held inquest on the dead bodies of Bahadur Shah, Abdul Ashraf, Ramdas, Appu Kuttan and Shahul Hamid. He also attached the food and other articles from the Ambika Vilas Hindu Hotel.

From the Export General Manifest prepared at Bombay and from the tally-sheets, it appears that the bags of maida and gram, which were consigned to S. D. K. Parameswaran Pillai, were loaded in hatches Nos. 3 and 4 of S. S. Jai Hind on voyage No. 166. From the boat notes prepared at the time of discharging the cargo it appears that these bags of maida and gram were discharged into barges Nos. 70 and 170.

From the materials placed before us it is clear that part of the cargo of maida, which was discharged by S. S. Jai Hind and which was consigned to Parameswaran Pillai, reached the Ambika Vilas Hindu Hotel; and that after taking food prepared out of that maida 71 persons fell ill out of whom 11 died and 60 recovered.

The next incident is dated 2nd May 1958. Six persons fell ill after taking coffee sweetened with sugar purchased from the shop of one K. C. Laurence. All the six persons were members of the same family residing at Mulankuzhi in the Ernakulam district. The persons who fell ill were Augustin, his mother Annamma, his daughter Lily, his wife Rosy, his son Thomas and his daughter Anjamma. Anjamma died on 2nd May 1958 and Rosy died on 3rd May 1958.

Annamma purchased on 2nd May 1958 sugar worth one anna from the shop of K. C. Laurence and prepared coffee for 6 persons and sweetened it with sugar purchased by her. After taking coffee Anjamma fell ill. Rosy also started purging, and the other persons

who took the coffee had diarrhoea and had vomiting sensation. All the six of them were removed to the hospital. They had also shivering and discomfort in the stomach and were feeling giddy and their vision was blurred. The child Anjamma died at about 6 P.M. at home and all the remaining persons except Thomas were taken to the hospital. Thomas was not treated in the hospital. Annamma recovered after four days.

The patients were treated by Dr. Kumaran, Assistant Surgeon in charge of the Government Hospital at Kalluruthi. He also performed the post-mortem examination on the dead body of Rosy. Dr. Kumaran stated that Rosy was in a comatose condition at the time of examination. She had perspiration and diarrhoea. Her pupils were contracted and she was very much dehydrated. There was frothing from the nose and the mouth of Rosy. Her pulse was very thready and irregular. Dr. Kumaran was of the view that the illness was due to poisoning, but he could not pin down what poison it was, at the time of the examination. Dr. Kumaran received information from Annamma as to the cause of death. Annamma was complaining of pain in the limbs and felt giddy and had diarrhoea and her respiration was hurried and the pulse rapid. Annamma was vomiting when she was admitted into the hospital. Lily was also in the same condition when she was brought into the hospital, except that she had not much diarrhoea. Dr. Kumaran gave treatment to all the patients.

Laurence has stated that he had purchased one bag of sugar from the shop of Maghji Malsi Private Ltd., Cochin, on 24th April 1958, and that out of that he had given one anna worth of sugar to Annamma and that thereafter the Health Officer of Mattancheri had sealed the balance of the sugar lying at his place on 3rd May 1958. It appears that even though Laurence stated that he had purchased the bag of sugar from Maghji Malsi Private Ltd., the bill which was produced by the firm of Meghji Malsi Private Ltd., was in the name of one Bhaskaran.

Xavier, an employee of K. C. Laurence, stated that he had gone to the firm of Meghji Malsi Private Ltd., to purchase sugar on behalf of Laurence and rice on behalf of Bhaskaran and he had purchased both the commodities, but by reason of some mistake the bill for purchase of sugar was made out in the name of Bhaskaran and not in the name of Laurence. There is no reason to disbelieve this evidence.

Dr. Kumaran had sent the viscera of Rosy to the Chemical Analyser for examination. The stomach contents and viscera of Rosy were found to be negative for parathion.

Mr. Madhav Menon, Principal of the Maharaja's College at Ernakulam, examined a large number of samples of foodstuffs which were sent to him and he submitted his report. Items Nos. 98 to 102 were of samples which were sent from the foodstuffs from the shop of K. C. Laurence and it was found that items Nos. 98, 100, 101 and 102 were positive for parathion.

From the evidence of Moolchand M. Shah, Director of Meghji Malsi Private Ltd., it appears that a bag of sugar was sold on 24th April 1958 under a bill which was issued in the name of Bhaskaran.

This one bag was out of the lot of 51 bags of sugar which were received by Meghji Malsi Private Ltd., by S. S. Jai Hind on voyage No. 166. It appears from page 5 of the Export General Manifest, that the number of the bill was H.R.S. MM. Ltd./51/1455, and from the tally-sheet, page 96, it is found that the 51 bags of sugar were loaded on hatch No. 1. It may be pertinent to note that the 51 bags of sugar were loaded on 27th March 1958 and the loading commenced at 9-35 A.M. and was completed at 9-42 A.M. on that day. It is useful to bear in mind that the 51 crates of folidol were loaded on hatch No. 1 between the hours of 11-2 A.M. and 11-9 A.M. on 27th March 1958. This consignment of sugar appears, therefore, to have been loaded shortly before the consignment of folidol was loaded into the ship.

The last incident occurred on 5th May 1958. One Prakasam, an infant, died at about 10-30 A.M. on 5th May 1958 in the village of Palluruthi in Ernakulam district. He ate a sweet lozenge out of the lot which was purchased by his grandfather Kandan and died shortly thereafter. Saraswati, daughter of Kandan, gave to her sister's son Prakasam a lozenge from Kandan's shop. After taking the lozenge Prakasam fell unconscious and he was taken to the hospital where he died. Kandan has a small grocery shop. He has two daughters, Saraswati and Chandramati. On 5th May 1958, he asked Saraswati to attend to the shop during his absence. When he returned at about 9 A.M. he came to learn from Saraswati that she had given a sweet lozenge to Prakasam and that Prakasam was weeping. The sweet lozenge was purchased from one Hansa—a hawker. Hansa, the hawker, stated that he purchased sweet lozenges from the confectionery of one Sadashivan at Mattancheri and that he sold a part of it to Kandan on 27th April 1958. He stated that he had learnt that some other persons had also fallen ill after eating the sweets sold by him. Hansa after learning about the illness of Prakasam and other persons returned the sweets, which had remained with him, to Sadashivan's factory.

Ramu, owner of the Sadashivan Sweet Factory, stated that he had purchased four bags of sugar from the firm of Meghji Malsi Private Ltd., in April 1958. He purchased 4 bags on 15th April and prepared sweets out of it, some of which were sold to Hansa. Ramu stated that the sugar received by him was wet and it was sold to him at reduced rate. Ramu did not note any change in the colour of the sugar or in the colour of the bags, nor did he find any smell in the sugar.

Evidently these 4 bags of sugar purchased by Ramu were out of the consignment of 51 bags received by Meghji Malsi Private Ltd., and they were utilised by Ramu for manufacturing confectionery. As we have already pointed out in dealing with the earlier incident, the 51 bags of sugar were loaded in hatch No. 1 of S.S. Jai Hind on voyage No. 166 shortly before the consignment of folidol was loaded.

This finishes the recital of incidents about which evidence has been led before us. From the evidence it is clear that in respect of practically all the 108 persons who had died, the source of contamination was the 55 crates of folidol which were consigned by Chika Private Ltd., Bombay, to A. V. Thomas & Co. Ltd., Cochin, by S.S. Jai Hind on voyage No. 166.

There were reports of illness in several other districts. Sub-Inspector Subramanyam has produced a statement showing district-wise the reports of poisoning cases till the date on which he gave evidence. It appears, however, from the statement of Detective Inspector Latif that the reports of illness in the districts of Palghat, Kozhikode and Cannanore were not traceable to folidol poisoning. In the view of Detective Inspector Latif they were due to psychological causes and had nothing whatever to do with folidol. Similarly in the districts of Alleppey and Kottayam there were reports respectively of 40 and 15 cases. No evidence has, however, been led before us to show that any of these instances were on account of illness attributable to contamination of foodstuff by folidol.

CHAPTER IV

FOLIDOL

Folidol E-605 is an emulsion containing 46.7 per cent. parathion, chemically known as diethyl paranitrophenyl thiophosphate. The pioneer work in this and other organophosphorous compounds was done by Gerhart Schrader, a German scientist, at the Elberfued Laboratories of I. G. Farber Industrie, about the year 1944. Schrader was engaged at that time in the study of chemical warfare agents, and synthesised scores of compounds containing organo-bound phosphorous. After World War II Schrader turned his attention to using organo-phosphorous compounds as pesticides. The compounds tested by him revealed a high degree of toxicity and a number of compounds, even when diluted to .002 per cent., gave almost 100 per cent. rate of mortality to insects.

Dr. S. B. Rao in his evidence referred to Remington's "Practice of Pharmacy", 11th Edition (1956), and relied upon the statement at page 684:

"Parathion is employed in agriculture as an organo-phosphorous insecticide. Like other organo-phosphorous compounds, parathion acts as an irreversible inhibitor of the enzyme cholinesterase. Hence, its muscarinic, nicotinic, and central neural effects are explained on the basis of the accumulated acetylcholine. Parathion is absorbed through the intact skin and all portals of the body. It is a potentially dangerous agent and death or serious illness may result in those who come in contact with it, if proper precautions are not employed to prevent its entrance into the body *via* the lungs, mouth and skin. Toxic symptoms include headache, giddiness, blurred vision, weakness, nausea, cramps, diarrhoea, and discomfort in the chest. Sweating, miosis, salivation, pulmonary edema, cyanosis, papilledema, convulsions, and coma are characteristic of more severe intoxication. Treatment consists of keeping the patient fully atropinized for as long as necessary, decontamination by washing the patient thoroughly with soap and water, removal of any ingested poison, artificial respiration with oxygen, hospitalization and constant medical and nursing attention. Poisoning in persons who work with parathion may be prevented by constant, thoughtful care on the part of every operator and by the use of protective clothing and masks."

He also referred to the passage at page 1602:

"The hazards of parathion are so great that it is often advocated that the compound be used only by or under the supervision of persons who fully understand the precautions that should be followed in handling and applying the insecticide. There is danger in handling and mixing

the insecticide. It is readily absorbed through the skin. When used without protective equipment, toxic reactions may result; also on prolonged exposure to the usual dusts or sprays".

In the view of Dr. S. B. Rao, parathion does not lose its toxicity, and is not volatile; but in contact with foodstuffs for a considerable time it may be inactivated. He also stated that parathion sprayed on growing crops may be inactivated, though he had no personal experience as to how long it takes to inactivate after application on crops. After referring to "Archiv Der Pharmazie" by Kaiser (1956 Edition) page 542, he stated that 21 per cent. of the fatal cases investigated in the Cathalin Hospital in Germany in 1953 were due to folidol, and in 1954 the percentage was as high as 53. Dr. Rao stated that, in the conditions prevailing in India, he did not advocate the use of parathion in any form as an insecticide because it was very toxic. In his view, the use of parathion as an insecticide was going down in other countries also and other insecticides less toxic but equally effective were being adopted.

Dr. A. R. Natarajan, Chemical Analyser to the Government of Madras, stated that folidol is highly toxic and that it is a contact poison, i.e., even by coming into contact with whole skin it may prove fatal. Dr. Natarajan stated:

"If one drop of folidol, which is 1/20 cc., is allowed to remain for 5 to 10 minutes on human skin may prove fatal after 9 to 10 hours. Even if it does not prove fatal, it may have severe toxic effect. Folidol contains 46.7 per cent. parathion. The lethal dose to human being as ascertained by the Academy of Forensic Sciences, United States, is 30 milligrams. The Forensic scientists of the U.K. place the fatal dose at 60 to 120 milligrams. One drop of folidol contains 20 to 25 milligrams of parathion. The psychological effect of folidol is that it inhibits the action of the enzyme called cholinesterase....."

Dr. Natarajan also stated that in the cases of patients who had survived the illness due to poisoning by folidol the stomach-wash gave negative finding for folidol because the poison taken by those patients was in quantity small and might have been eliminated by vomiting and diarrhoea or that the quantity may be smaller than the quantity capable of being detected with the aid of laboratory instruments at the disposal of the investigator. Dr. Natarajan had come across 25 medical legal cases of parathion poisoning in the districts of the Madras State in the performance of his duties. In some cases he was informed that the death was due to folidol, and some times it was found on chemical tests to be parathion poisoning. The first few of these cases, Dr. Natarajan stated, were from Government tea plantations and orchards, and the later cases of parathion poisoning were among small agriculturists. Dr. Natarajan has submitted a tabulated statement (which was received by us after this report was ready) setting out details relating to the patients, their illness and the causes. We have appended that statement as Appendix V to this report. He learnt on enquiry that the department of agriculture was freely distributing folidol

for use as an insecticide and he had brought the hazards involved in the use of folidol to the notice of his Government. Dr. Natarajan also reported an incident in which he was personally concerned. He conducted an experiment on folidol by adding 2 drops of folidol in 1000 cc. of water and keeping it in a tall jar so as to prevent quick dispersal, and at the end of the day a large majority of those who were working in the laboratory felt giddy and some were unable to sleep. That experiment was repeated on the next day and all the persons in the laboratory had the same reaction. From these symptoms Dr. Natarajan concluded that giddiness and inability to sleep were due to folidol poisoning. Dr. Natarajan admitted that there was some difference in the degree of contamination by folidol and parathion as a result of contact with the skin, but that by inhalation the effect of folidol and parathion was the same. He stated that by reason of the presence of the emulsifying agent folidol may not prove immediately toxic to the whole skin. Dr. Natarajan stated that his observations applied to all organo-phosphorous compounds which were 19 in number. He also stated that having regard to the conditions prevailing in India and the practical considerations which applied to the distribution and use of folidol, he would not advocate continuation of its uses except under the direct control of the State in the matter of manufacture, distribution and use. He also stated that in his view by the use of folidol not only pests which damaged the plants were likely to be destroyed but even beneficial insects which propagated polination might be destroyed by the use of folidol and it may be harmful to agriculturists.

Dr. N. K. Iyengar, Director of the Central Forensic Science Laboratory at Calcutta, stated that in the blood parathion had a toxic effect, that 6 milligrams per kilogram body-weight was the lethal dose for rats. that at that rate 360 milligrams would be on average dose for killing a human being, that 10 to 12 milligrams had been found to be the minimum lethal dose for a human being and that if there was complete absorption three times the lethal dose orally administered was sufficient to prove fatal by absorption through skin. He also stated that parathion did not produce any local irritable effect, and that if one drop fell on the skin it might prove fatal, but that one drop of folidal should not normally produce death even if it was not washed off immediately, though there might be severe toxic effect. He stated that inhalation of parathion vapour was dangerous and that three milligrams when atomised in a meter of space may not be fatal but would start producing ill-effect. Referring to the residual effects of parathion spraying, Dr. Iyengar stated that on lifeless surface parathion remained an active agent unless it was washed out or otherwise removed, because the vapour pressure was so small that it was not likely to evaporate. On live surfaces like green leaves, it was stated, parathion penetrates and fermentative breakdown of parathion takes place on live surfaces so as to break it up into its components which may also be poisonous. According to Dr. Iyengar's estimate, after 3 to 4 days a substantial part of parathion sprayed on green leaves practically disappears; but when sprayed on fruit the disappearance of folidol is purely due to physical forces and on leaves it is really due to the action of some enzyme. He then stated that the use of parathion had the danger of "upsetting the biological balance", i.e.,

killing the useful insects. In his view, if the governments concerned were able to supervise the distribution and use of folidol after making the necessary investigation, then alone he would advise the continuance of the use of folidol as an insecticide. He advised that an investigation should be made and the possible advantages of the use of folidol be studied before its continuance or discontinuance as an insecticide may be decided. He recommended continuance of the use of folidol with protection of masks, protective clothing and eye-shields and proper supervision but not otherwise.

P. D. Nair, Director of Agriculture of the Kerala State, and C. J. Selvarajan, Plant Protection Officer in the Department of Agriculture in the Kerala State, also gave evidence. P. D. Nair stated that in his view folidol had some beneficent properties in pest control but he did not recommend that folidol should be distributed only through State agency. He suggested that very strong measures be taken to educate the public in the use of folidol, that agriculturists should be informed that folidol should be used only in certain contingencies when no other effective insecticide was available and that instructions should be imported to the agriculturists explaining the properties of folidol. He recommended licensing of sale of folidol and suggested that the licensees should be required to use the sprayer under the supervision of the distributor. He further recommended that the present system of distribution of folidol through private agency be continued but subject to a system of licensing.

C. J. Selvarajan appeared to be of the view that the use of folidol was highly beneficial to agriculturists, especially in the control of paddy stemborer pests. He stated that in the State of Kerala folidol was sprayed only when an officer of the State was present and not otherwise, that the containers of folidol were only sold to agriculturists and that agriculturists were given assistance of a State employee in spraying folidol. He admitted that he did not make any extensive trials or study of folidol or other insecticides, but asserted that he had not come across a case in which there had been casualties as a result of folidol poisoning.

The evidence of P. D. Nair is somewhat inconsistent with the evidence of Selvarajan. Nair has admitted that agriculturists could purchase from A. V. Thomas & Co. Ltd., such amount of folidol as they required for spraying purposes and that the containers of folidol were sold also by the agricultural department without insisting upon spraying under the supervision of a State employee. He also admitted that the State had not sufficient equipment or utensils which could be supplied to the agriculturists for spraying folidol. Selvarajan appeared to state that every purchaser of folidol had to spray it under the supervision of an employee of the State and that the utensils in which folidol was diluted were either supplied by the State, or where private utensils of agriculturists were used they were cleaned by repeated washing under the supervision of the representative of the State. P. D. Nair, however, stated that there was no such supervision maintained.

On the materials placed before us, there can be no doubt that folidol is a deadly poison. In what circumstances folidol is likely to be dangerous to human beings is a matter on which there is some difference of opinion. There is also difference of opinion on the question whether parathion, the active constituent of folidol, is broken up into its components after coming into contact with live tissues or whether it is a systemic poison which is stored in the human body.

One Bernhardt, a representative of Bayers of Germany, was examined as a witness by Chika Private Ltd. The witness appeared to say that 6 milligrams of parathion per kilogram body-weight was fatal to human beings if orally administered but 100 milligrams per kilogram body-weight were required to be absorbed through the human skin before it could prove fatal. Why there should be this vast disparity in the quantity of parathion orally administered and parathion absorbed through the human skin, the witness was unable to explain. If parathion has the effect of arresting the cholinesterase and thereby affecting the function of the heart and lungs, it may be difficult to accept that there should be this wide disparity between the quantities of parathion orally administered and absorbed through the skin. The witness further stated that 650 milligrams per kilogram body-weight of folidol must be absorbed through the human skin to prove fatal. All these statements were made by Bernhardt not on any personal investigation made by him but on what he represented were the results of investigation made by Bayers. The witness admitted that he was not a specialist either in toxicology or in pharmacology or even in chemistry. It is difficult to accept the assertions made by the witness unsupported by any reliable literature. It may also be observed that the information supplied by Bernhardt depends upon the data collected on experiments performed on rats. We have, however, no reliable evidence to check up the assumption that the effect on human beings of folidol orally administered or by absorption through the skin or by inhalation can be calculated from the effect a defined quantity of folidol has upon rats, by multiplying the quantity with the ratio between the average weight of a human being and of a rat. We do not think that in this case we will be justified in entering into details of an academic controversy about the degree of toxicity of folidol on human beings calculated from experiments on rats and laboratory animals. We have before us clear evidence of a case in which it is established beyond doubt that by taking coffee prepared with one anna worth of sugar contaminated by folidol two persons died and four became seriously ill. There is also the evidence that after eating one sweet lozenge prepared from sugar, which was contaminated, one child Prakasam died. There is also the evidence that Jamadar Rajamanickam of A company of the L.S.S. camp at Sasthankotta died after eating one poori prepared for B company. It appears that the sugar which was used for preparing coffee and lozenge had no unusual appearance or smell, and the contamination was very slight. Similarly, it appears from the evidence of the cook and the store officer of the Sasthankotta camp that the atta which was used for preparing poories had no appreciable smell or stain and still poories prepared out of the atta killed as many as

65 persons. We do not, therefore, think that in the absence of any reliable data, which may establish before us the toxic qualities of folidol on human beings, we would be justified in assuming that the experiments, which are stated to have been performed on rats, will adequately guide us in ascertaining the toxic qualities of folidol or parathion on human beings.

It is clear that parathion is a polytoxic insecticide acting as a contact respiratory and stomach poison. That it has resulted in severe illness and death of several persons who had occasion to use it is not attempted to be minimised. The question then arises whether uncontrolled distribution of folidol by merely attaching to the containers instructions in nine different Indian languages as is at present the practice and by indicating on the containers that the contents are poison, is a sufficient protection against possible hazards from the use of E-605.

Folidol is highly toxic and has to be used with caution. It is true that parathion—the poisonous principal of folidol—has important properties as an insecticide and it may have beneficial effect in increasing the agricultural output of the country. Again, if all the requisite precautions suggested by the manufacturers are taken, the chances of immediate hazard to the persons concerned in the use of folidol may be comparatively small. But when precautions have to be taken or rules to be framed for enforcement of precautions, the rule-making authorities will be concerned to deal not with the ultra-careful worker who follows the letter of instruction but the normal and careless worker. It is not sufficient to say that even a highly toxic material is safe if handled with care and that a case of poisoning was the result only of an operator's carelessness and that the fact that he was poisoned was a consequence of his own folly. The rules drawn up for the protection of those handling toxic materials must be directed toward prevention or reduction of the most serious hazards and to be effective must be simple to observe and easy to enforce. That the uncontrolled distribution of folidol in India is likely to involve serious hazards to the workmen and to other persons also cannot be gainsaid. The circumstances in which have necessitated the present enquiry amply illustrate the necessity of effective controls being imposed upon the manufacture, storage, transport, distribution and use of folidol.

It has to be borne in mind that folidol is one of the group of organo-phosphorous compounds and is one of the most lethal ones. There is not sufficient material in the text books or in the evidence of the witnesses examined before us to show what the chronic effect of folidol poisoning is, or whether folidol contamination involves any long-term hazards. Even in countries where extensive investigations have been made, there appear to be a considerable gap in the knowledge relating to the behaviour of folidol on human beings and on the beneficent insects which propagate pollination. It would, therefore, be necessary to make a full investigation of the hazards involved in the use of folidol from all points of view before a final opinion can be expressed regarding its continued use and that investigation must also take into account the question whether there

are other organo-phosphorous compounds or other compounds which might be equally beneficial in agriculture and may involve lesser hazards to human beings. We propose to make recommendations, therefore, in regard to the continued use of folidol under the heading "what steps should be taken to prevent the recurrence of similar occurrences?"

In this connection it is necessary also to consider what is the proper medium for storage of folidol. Bernhardt stated that he came over to India to advise Chika Private Ltd., about the processing of folidol in India and also to consider the suitability of containers which may be adopted for storing folidol. According to Bernhardt, attempts were made to secure aluminium containers from the Aluminium Company of India but the company was unable to supply containers of the specifications required. He also contacted the Metal Box Company of India Ltd. When it was found that tinned containers with lacquer coating were also not suitable for storage of folidol, folidol having a long-term corrosive effect both on the lacquer and the metal, it was decided to use polyethylene containers. Bernhardt says that Bayers had made experiments in Germany about the suitability of polyethylene for storing folidol, that the grade of alkathene used for the containers was 2, and that was found alone suitable for storage of folidol. He further stated that folidol was exported by Bayers to Venizuela and South American States in polyethylene containers. The witness stated that in India he made physical tests for testing the tensile strength of polyethylene containers on a sample carboy obtained from Bright Brothers Ltd., which was represented to be made of alkathene Q-40 and it was found to be suitable. Bernhardt further says that he consulted a plastics expert Mr. Zander who told him that polyethylene containers were suitable for storage of folidol. Bernhardt stated that the sample carboy which he tested had a closing device which consisted of two parts—a cup and a screw-cap. He stated that he had not seen a cap like the one which was produced before the Commission which combined the cup and the screw-cap.

It is not disputed that aluminium containers have been found to be safe for storage of folidol. For more than five years folidol was imported in India in aluminium containers and there is no evidence of any breakage of or leakage from aluminium containers. The statements made by Subba Rao and Bearnhardt that attempts were made to secure aluminium containers in India and they were unsuccessful cannot, in the absence of more reliable evidence, be accepted on their face value. Again, there is the positive assertion made by Bernhardt that tin containers with inner lacquer coating were also found to be unsuitable for storage of folidol. This requires further investigation. It may be that certain grades of alkathene may be suitable media for storage of folidol but before any opinion can be expressed on that question it would be necessary to make the fullest investigation as to the properties of different grades of alkathene in contact with folidol and its vapours. There can be no manner of doubt on the evidence before us that the screw-caps which were manufactured from alkathene Q-53 by the injection moulding process were subject to severe environmental cracking

and there was leakage of the contents of the carboys of folidol. Whether the material of which the carboy have been prepared, viz., alkathene Q-40, also is a suitable material for storage of folidol, is also a matter for investigation.

The containers made from alkathene appear to have been adopted very recently by Chika Private Ltd., for storage of folidol. That, it was asserted, was done because other suitable containers were not available. But if other suitable containers were not available, the suitability of alkathene containers for storage of folidol should have been ascertained by adequate tests before they were adopted for storage of folidol. No attempt appears to have been made to have an investigation made as to the suitability of alkathene through any of the institutions from which opinion could have been obtained. Neither Bernhardt nor Subba Rao has attempted to ascertain the chemical reaction of folidol upon alkathene. From the evidence of Dr. Nanji it appears that alkathene Q-53 under stress is subject to environmental cracking in contact with folidol within a short time.

On the materials placed before us we are of the view that Chika Private Ltd., without proper investigation, adopted a form of container which was not suitable for storage of folidol. In this connection, it was urged before us by Mr. D'Silva that in Germany alkathene-2 was found to be suitable material for containers of folidol and that Chika Private Ltd., were justified in acting upon the advice given by Bernhardt in that behalf. Again, we have no evidence before us, except the bare word of Bernhardt, about the storage of folidol in alkathene containers in Germany. Even Bernhardt admitted that in Germany folidol is distributed in aluminium containers. The suggestion that Bright Brothers Ltd., induced Chika Private Ltd., to accept carboy with screw-caps made from a grade higher than the alkathene grade, of which the bodies of the carboys were made, and contrary to the express specifications, does not stand the test of any serious scrutiny. Evidently the carboy—a useful storage vehicle—consists of both the cap and the carboy itself. If the cap is subject to cracking in contact with folidol, it cannot be said that the carboy is a sound storage vehicle for folidol. Mr. Punwani of Bright Brothers Ltd., has stated that no specifications were asked for by Chika Private Ltd., and that his firm was not informed about the purpose for which the carboys were needed; and there appears to be no reliable evidence to show that any specifications were asked for or insisted upon by Chika Private Ltd.

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

We may now turn to the topics on which we are asked to make our report. The first topic on which the Commission is asked to report is "the circumstances in which and the causes whereby food or foodstuffs used for preparing the food came to be contaminated." We have set out in detail the evidence relating to voyage No. 166 of S.S. Jai Hind from Bombay to Cochin Harbour and to discharge of cargo in the barges in Cochin Harbour, and the ultimate unloading of cargo in the godowns of the Malabar Steamship Co. Ltd., and the release of the goods to the various consignees. We have also set out the circumstances in which the contamination of foodstuffs appeared to have taken place.

On a review of the evidence, the following conclusions emerge:

S.S. Jai Hind carried a cargo of 55 crates of folidol in hatch No. 1 during its voyage No. 166. This cargo was loaded on 27th March 1958 between the hours of 11-02 a.m. and 11-09 a.m. The loading of cargo in hatch No. 1 in the ship commenced at about 8-30 a.m. on that day. From the Export General Manifest and the tally sheets it is clear that Maghji Malsi Private Ltd, received a consignment of 150 bags of Anchor Brand Maida from the Wallace Flour Mills Ltd., Bombay, by S.S. Jai Hind on voyage No. 166. Out of these 150 bags, 100 bags were delivered from the godowns of the Malabar Steamship Co. Ltd., to the consignees and the remaining bags were delivered to the purchasers directly from the godowns of the Malabar Steamship Co. Ltd. Out of the 150 bags, 15 bags were sold to John Thomas Porthookkaren, Cochin, on 6th April 1958. From John Thomas Porthookkaren 3 bags were purchased by Simon William Almeida of Pallipura on 10th April 1958, and from Almeida, Gopalan of the village of Vaddakkekara purchased 3/4th of a maund. The connection is, therefore, established between the flour which was consigned on board S.S. Jai Hind on voyage No. 166 and a part of which was ultimately purchased by Gopalan and which was consumed by the twelve persons who fell ill on 13th April 1958. The Chemical Analyser's certificate shows that the biscuits, rusks and flour were contaminated by folidol. It is true that the 150 bags were not stored in hatch No. 1 in which the crates of folidol were stored, but they were in the other hold. But, as we have already pointed out, the leakage took place on board the ship, and the consignments stored in different hatches were mixed up in the barges and ultimately they were also mixed up before they were stored in different godowns.

The sugar which was used for sweetening tea which caused the death of Hari and Govindan was purchased from the shop of K. C. Anthony. K. C. Anthony had purchased from Mookan Devassy Ouseph & Son on 7th April 1958, 16 bags of sugar and out of these bags in one bag which contained 110 lbs. of loose sugar parathion

contamination was traced. The invoice shows that the sugar was purchased by Mookan Devassy Ouseph & Son from Jos Thomas and it was received by S.S. Jai Hind on voyage No. 166. From the Export General Manifest and the tally sheets in the light of the invoice, it appears that 100 bags of sugar were loaded in hatch No. 1. These 100 bags of sugar were stored in hatch No. 1 between the hours of 9-19 a.m. and 9-34 a.m. on 27th March 1958, and folidol crates were stored in hatch No. 1 between the hours of 11-02 a.m. and 11-09 a.m. on 27th March, i.e., shortly after the sugar bags were loaded, on the top of the sugar bags.

In the incident which took place on 27th April 1958 where two children—Radha and Ratnagar—died after eating biscuits purchased from Joseph, the contamination took place in the bakery of Augustin in which one Rajan had baked biscuits from maida contaminated by folidol. Rajan had purchased his supply of maida from William Almeida and William Almeida had purchased maida from John Thomas Porthookkaren and that merchant had purchased his supply from Meghji Malsi Private Ltd. The flour, as we have already stated, was stored in hatch No. 3.

The fourth incident in which Bharati died and five other persons fell ill was the result of eating 'uppuma' prepared out of suji. This suji was purchased from the shop of C. V. Anthony who had purchased the same from Mane & Co. Mane & Co. had ordered out their requirement of flour from the Wallace Flour Mills Ltd., Bombay. From the Export General Manifest and the tally sheets it appears that "Baloon Brand Suji" (wheat pollard) was stored in hatch No. 1 on 27th March 1958 between the hours of 8-31 a.m. and 8-34 a.m., i.e., a short time before the folidol crates were stowed in that hatch.

In the fifth incident 6 persons died as a result of eating preparations made of suji, and two other persons—Chakkappan and his son Krishnan Kutty—fell seriously ill. The suji was purchased from the shop of Varid, and Varid in his turn had purchased two bags of suji from Mane & Co. Mane and Co.'s suji was stowed in hatch No. 1 of S.S. Jai Hind on voyage No. 166 between the hours of 8-31 a.m. and 8-34 a.m. on 27th March 1958.

About the 6th incident, there is no evidence as to the source of the sugar which contaminated the coffee which was served to Babu, Rosi and the infant son of Narayan Nair, who died.

In the seventh incident, 66 persons fell ill and seven of them died as a result of taking 'semiya payasam', which was a preparation made of maida, gur and ghee, purchased from hawkers Syed Kassim and Syed Ibrahim. Syed Kassim purchased from Bhargawan 3½ lbs. of maida. Bhargawan purchased his requirement from S. D. K. Parameswaran Pillai, and Parameswaran Pillai got the bags of maida from the firm of Naishadkumar & Co., through his clearing agent N. N. Konar. It appears from the Export General Manifest and the tally sheets that 339 bags were stored in hatches Nos. 3 and 4 and in these bags were included the bag supplied to S. D. K. Parameswaran Pillai.

In the eighth incident, which is the Sasthankotta Camp incident, as many as 200 persons were taken ill out of whom 65 died. The illness was due to eating poories and cooked potatoes. It appears from the evidence that the source of poisoning was the poories. These poories were prepared out of atta supplied by K. Gopala Pillai, who had purchased 10 bags of atta from Mookan Devassy & Son, 15 bags of wheat pollard from Meghji Malsi Private Ltd., and another 15 bags of wheat pollard from C. L. V. Brothers. C. L. V. Brothers had purchased those bags from Maneklal Bhagwanji. From the Export General Manifest and the tally sheets it appears that the bags which were consigned to Maneklal Bhagwanji were stored in hatch No. 1 between the hours of 8-23 a.m. and 8-30 a.m. on 27th March 1958. The bags which were consigned to Mookan Devassy Ouseph & Son were stored in hatches Nos. 3 and 4 on 27th March 1958 and the bags which were consigned to Meghji Malsi Private Ltd., were stored in hatch No. 3 on 26th March 1958.

The ninth incident is about 71 persons having fallen ill, out of whom 11 died. All these persons had eaten banana fritters and 'modakam' prepared in the Ambika Vilas Hindu Hotel at Kadampanad, from wheat flour and gur purchased from the shop of T. V. Narayanswami Reddiar. T. V. Narayanswami Reddiar purchased his requirement from S. D. K. Parameswaran Pillai who had imported 15 bags of maida from Naishadkumar & Co., Bombay. This cargo was stowed in hatches Nos. 3 and 4.

Then there is the incident about the death of Prakasam who died on 5th May 1958 after eating a sweet lozenge sold by one Hansa. Hansa had purchased his requirement of lozenges from one Ramu, manufacturer of sweets, and Ramu had purchased the sugar required by him from Meghji Malsi Private Ltd., on 15th April 1958 and 19th April 1958. 4 bags of sugar which were purchased on 15th April 1958 were out of the consignment of 51 bags received by Meghji Malsi Private Ltd., by S.S. Jai Hind on voyage No. 166.

Then there is the incident dated 2nd May 1958 in which two persons died and four fell seriously ill as a result of taking tea sweetened with sugar purchased from the shop of Laurence. Laurence purchased sugar required by him from Meghji Malsi Private Ltd., on 24th April 1958, out of the cargo which was received from hatch No. 1 of S.S. Jai Hind on voyage No. 166.

This resume of evidence establishes a chain of events, which culminated in the contamination of bags of sugar, atta, maida and wheat pollard, and ultimately resulted in the death of more than 100 persons and illness of more than 400 persons, and reduces itself to six important causes of the tragedy:

- (1) There was faulty storage of folidol in polyethylene carboys by Chika Private Ltd., which were not actually tested for suitability for storage of folidol. There was also failure to pack the carboys in absorbent material as suggested by the Government of India. There was also failure to provide adequate labelling on the wooden crates.
- (2) A false description of the consignment of folidol as "harmless chemical" was deliberately made by Chika Private

Ltd., and their clearing agent V. V. Dabke, with a view either to evade liability to pay freight charges at a higher rate or to evade making a declaration under rule 4 of the Indian Merchant Shipping (Carriage of Dangerous Goods) Rules 1954.

- (3) The New Dholera Steamships, Ltd., its servants and agents failed to ascertain that the crates of folidol consigned by Chika Private Ltd., contained dangerous goods. If they had taken adequate precaution, they could, with reasonable diligence, have known, or would have had reasonable grounds for suspecting, that the contents of the 55 cases marked 'Folidol E-605' were 'dangerous goods' within the meaning of rule 4 of the Indian Merchant Shipping (Carriage of Dangerous Goods) Rules, 1954.
- (4) That the crates of folidol which were marked "poison" were stored by the officers of the ship under the directions of the Chief Officer of S.S. Jai Hind with foodstuff in hatch No. 1 in contravention of clause 7 of the Indian Merchant Shipping (Carriage of Dangerous Goods) Rules, 1954.
- (5) Even after knowing that there had been leakage no attempt was made at Cochin to prevent further contamination of the food cargo, and the cargo of folidol was mixed up with bags containing foodstuff in the barges when transporting the same from the ship to the godowns, and
- (6) Contamination of foodstuff took place also on the quayside near the godown of the Malabar Steamship Co. Ltd., and in the godowns of the Malabar Steamship Co. Ltd., where the goods were indiscriminately stored.

The second topic on which we are required to report is whether the contamination could have been avoided or detected in time.

In our view, contamination could have been avoided—

- (1) if folidol had been stored in suitable containers and had been packed and labelled suitably;
- (2) if a false description was not made of the contents of the crates by Chika Private Ltd., and their clearing agent V. V. Dabke;
- (3) if a declaration had been made under rule 4 of the Indian Merchant Shipping (Carriage of Dangerous Goods) Rules 1954;
- (4) If the New Dholera Steamships, Ltd., had taken adequate precautions to ascertain the dangerous nature of the cargo and had stored it separately and not with foodstuffs in contravention of the rules; and
- (5) if adequate precautions had been taken to prevent the mixing of the cargo of folidol and food cargo in the barges, in the quayside and in the godowns of the Malabar Steamship Company, Ltd.

In our view, the contamination could have been detected when it was known that some crates of folidol, which were noted in the boat notes and the Import General Manifest as 'E. & S. Liquid', were leaking, if steps had been taken to ascertain what the nature of the contents of the leaking crates was and steps had also been taken to segregate the articles, boxes or crates which were contaminated.

The third topic on which we are asked to report is "the action, if any, taken by the person or persons concerned after the detection of such contamination to prevent further distribution of the contaminated goods or foodstuffs."

This topic must be discussed in the light of the conduct of different persons who had occasion to deal with the consignment of the cargo of folidol and also the authorities of the State of Kerala and the police and municipal authorities. It appears that except by the authorities of the State of Kerala and the merchant community of Mattancheri, who can be regarded as the person or persons concerned, no steps were taken to prevent further distribution of contaminated food or foodstuffs. When it came to be known that there had been many fatal cases of food poisoning, the State of Kerala took prompt steps to investigate the source of contamination; and when it was found by Sub-Inspector Mathews that the common source of poisoning was some chemical which was lying in the godown of A. V. Thomas & Co., Ltd., which had been removed from the godown of Malabar Steamship Co. Ltd., the foodstuffs and foodstuffs which had come into contact with those foodstuffs were ordered to be attached.

Mr. M. K. Devassy, Collector of Ernakulam, has given details of the steps taken by him. On 1st May 1958 under the direction of the Chief Minister of the State he proceeded to Mattancheri, held a conference with the importers, the municipal Chairman and health officers, and suggested to the merchants that sale of atta and sugar be stopped. The merchants agreed to the proposal. The municipal health officers were advised to take samples of atta and sugar which they did. A discussion was held with the Indian Chamber of Commerce and in the discussion ways and means to be adopted for stoppage of any possible further contamination of foodstuffs were devised. The Indian Chamber of Commerce issued a directive to all its members to stop sale of atta, maida, sugar and all varieties of flour. Similar instructions were also issued to the wholesale merchants. The Government of Kerala, at the instance of the Collector, issued orders stopping sale of atta, maida, sugar and all varieties of flour. The District Superintendent of Police, Cochin, having received information that the cause of contamination was some chemical received by A. V. Thomas & Co. Ltd., immediately attached the folidol containers in the godown of A. V. Thomas & Co.-Ltd. A conference of the local M.L.A's, municipal and district health officers and joint district medical officers, Municipal Chairman, and the Superintendent of Police, Tahsildars and other revenue officers was held by the Collector and pending further action it was ordered, with the consent of the merchants, that the stocks of sugar, atta and maida be seized. It was also directed that the Panchayat Presidents be informed after holding a conference to publish widely the precautions to be taken in that behalf and the directions for attachment of sugar, atta, maida,

etc. Mr. Devassy then satisfied himself that the articles which were received after 1st April 1958 at Cochin could not have been contaminated, and, therefore, he permitted release of those stocks. But on investigation it was found that certain samples of foodstuff which had not arrived by S.S. Jai Hind on voyage No. 166 were also contaminated by parathion, presumably because the foodstuffs had been stored with contaminated foodstuffs. He accordingly contacted the authorities of the State and again got into touch with the Chamber of Commerce and had discussions with the Chamber. He then suspended some of the permits issued after taking the merchants into his confidence and explaining the fresh development to them. The merchants agreed that they will not release goods which were imported and brought into the godowns till the godowns were effectively cleansed.

The health authorities from time to time took samples and as many as 3,000 samples were submitted to Professor Madhavan Menon, Principal of the Maharaja's College, Ernakulam, and they were submitted to examination. The State of Kerala also issued various directives for preventing the sale of contaminated food. It is true that the medical officers who had examined the persons who were taken ill on account of food poisoning on and after 13th April 1958 could not find the exact nature of the poison which contaminated the food. But no fault can be found with them. Research in insecticides and especially organo-phosphorous compounds like parathion is a recent development and the symptoms exhibited by parathion poisoning were similar to the symptoms of cholera. The health authorities, having come to learn that the poisoning cases were as a result of consumption of food from a common source, appear to have taken steps, though not always promptly, to attach foodstuff or the materials out of which those eatables were prepared, and no fault can be found with them also.

The fourth topic on which the Commission has been asked to submit its report is "whether there had been any failure in taking adequate measures for the avoidance or timely detection of such contamination, and the person or persons responsible for such failure."

The contamination was detected for the first time on board S.S. Jai Hind when the hatches were opened and the cargo was being discharged at the port of Cochin. As we have pointed out in dealing with the evidence, some of the bags were stained and at least 4 crates of folidol were found leaking. In our view, the ship's officer and the Cargo Supervisor could have taken steps to inform the health authorities that the crates which were leaking were marked 'poison' and they might have thereby prevented distribution of the contaminated food or foodstuffs. Similarly, in our view, the landing clerk of the New Dholera Steamships Ltd., having come to learn of the contamination of foodstuffs by folidol, could have taken similar steps. We regard also Rattansey Panchan and the godown-keeper Alexander as persons who have failed to take, after detection of contamination, steps to prevent further contamination of foodstuffs and distribution of contaminated foodstuffs. The story of Alexander that he never

went into the godowns and had no occasion to see the crates of folidol and their storage cannot be accepted by us. Rattansey Panchan is the manager of the stevedore company and also of the Malabar Steamship Co. Ltd., and he must have come to learn on 10th April 1958 that A. V. Thomas & Co. Ltd., had declined to take delivery of a part of the cargo of folidol. If he had taken proper steps, he would have been able to prevent further contamination and distribution of contaminated foodstuffs. A. V. Thomas & Co. Ltd., appear to have known that folidol crates were leaking. But we cannot impute to them the knowledge that any foodstuffs were contaminated by leakage of folidol from the crates of folidol. A. V. Thomas & Co. Ltd., appear to have informed the shipping company at Bombay by letter dated 16th April 1958 that there had been leakage of the crates of folidol. The statement of Varkey, agent of A. V. Thomas & Co. Ltd. in Mattancheri, that he had no knowledge as to the nature of folidol, cannot be accepted: but we do not think that on that account he can be regarded as a person who had failed to take requisite steps.

The last topic on which our report is called for is about the measures to be taken to safeguard against similar occurrences in future.

Our report on this topic must fall into two broad divisions. The first division deals with the measures to be taken in the disposal of foodstuff which has been attached under the orders of the State authorities of Kerala. Unless it is definitely established that this attached foodstuffs is not contaminated by parathion, it cannot be safely permitted to be distributed for consumption amongst the public. If without adequate investigation the attached foodstuff is permitted to be distributed, catastrophes, even on a more extensive scale than the ones which have occurred in the State of Kerala in the months of April and May 1958, may occur. The second part in which this matter must be considered is about the measures to be taken to safeguard against the possibility of contamination by insecticidal poisoning in future. In our view, this enquiry is also within the scope of the terms of reference under clause (e). Evidently this enquiry is very extensive and touches on various problems relating to manufacture, storage, transport and use of folidol, which, in the limited time at our disposal and the vastness of the problem, cannot be fully investigated by us, and the recommendations to be made by us must of necessity be general.

Turning to the first division, we have the evidence that the samples taken from the foodstuffs attached had been submitted by the health authorities to the authorities of the State and they have been subjected to analysis, and a very small percentage of these foodstuffs have been found to be contaminated. Professor Madhav Menon, Principal of the Maharaja's College at Ernakulam, stated that about 2,000 samples were received by him and that the same had been investigated from time to time. Dr. Janardhan, Public Analyst, has stated that his laboratory has received more than 2,000 samples in connection with the recent food poisoning cases and that only 50 out of them remained unexamined. He stated that out of the 2,000 samples 300 were analysed by the general chemistry department of the University College and 1,650 samples were examined in his

laboratory. From out of the 300 samples examined only 3 were reported to be positive for parathion and even in those three samples the contamination was very small. More samples were asked for and examined and they were also found negative for parathion. Dr. Janardhan has stated that instructions were given to the health authorities to ascertain whether there were any stains on the bags or in the contents, and, if there were stains, to obtain the samples from foodstuff proximate to the stains. He stated that the samples sent to the department did not represent the entire lot from which the samples were taken and, therefore, he could not recommend, even if the results were negative, that the stocks be released.

It appears from the report made by the Food Poisoning Enquiry Committee (page 41) that "negative laboratory findings are undependable because of defective sampling. Positive tests if corroborated in presumptive cases by spectrophotometric tests can alone be depended upon." Having regard to the findings and the conclusions of the Food Poisoning Enquiry Committee, we are of the view that before any part of the foodstuffs attached under orders of the State Government of Kerala can safely be released for consumption, representative samples from each bag or container should be obtained by a thorough mixing up of the contents of the bag or container in the presence of some health authority and those samples must be subjected to independent tests in more than one laboratory and unless the findings are negative for parathion poisoning by the Averell and Norris tests as well as the spectrophotometric test and such other tests as the authorities may deem necessary to apply, the foodstuffs should not be permitted to be released for consumption.

On the second part, our recommendations must of necessity be somewhat general. We have no doubt that at least 104 out of the 108 persons who died between the 13th of April and 5th of May 1958 of food poisoning in the State of Kerala died as a result of eating food contaminated by folidol. Folidol is one of the numerous insecticides which are being used at present the world over for protection of agricultural crops and foodstuffs and it is prepared from parathion which is one of a chain of highly toxic organo-phosphorous compounds. In order to prevent any hazard to the public by the use of parathion and related organo-phosphorous compounds and also similar insecticides, we are of the view that provision should be made by statute to control the manufacture, storage, transport, distribution and use of these insecticides. It may be noted that use of insecticides in agriculture is comparatively a recent development. It is for the first time in the third decade of this century that insecticides such as DDT and BHC were evolved. They were found to be useful and comparatively of very little toxicity to human being. Since the development of DDT and BHC a vast number of insecticides with varying degrees of toxicity have been prepared. In the year 1951 in the United Kingdom a Committee was appointed to report to the Minister of Agriculture and Fisheries of the Working Party on the precautionary measures to be taken against toxic chemicals used in agriculture. The Committee was appointed under the chairmanship of Professor S. Zuckerman to enquire into (a) the nature of the chemicals which had given rise to fears for the health, safety and welfare of agricultural workers, and the case for their continued use; (b) the

mode of action of the chemicals and their dangers to man; (c) facts about the accidents which had occurred in the agricultural use of the chemicals; (d) the measures which had so far been taken for the protection of the workers; and (e) protective measures suggested for the future. The Committee made its enquiry and submitted its report which has been published in 1951 as "Toxic Chemicals in Agriculture" (Report of the Working Party). It was reported that the organo-phosphorous compounds had a wide range of usefulness and the same was extending even further as a result of experimentation with different kinds of insecticides. The Committee after recording its conclusions made certain recommendations under the following heads:

- (1) Protective clothing.
- (2) Tractor Cabs.
- (3) Washing facilities.
- (4) Working periods.
- (5) Supervision.
- (6) Meals.
- (7) Decontamination of machinery and equipment.
- (8) Warning to local doctors.
- (9) Manufacturers' responsibilities.
- (10) Instructions.
- (11) Research.

Pursuant to this report, the Parliament in the United Kingdom passed the Agriculture (Poisonous Substances) Act, 1952, which by section 1, clauses (2) and (3), conferred upon the Minister of Agriculture and Fisheries and the Secretary of State power to issue regulations in the matters specified therein. The Act also provides for the duties of employees, appointment of inspectors and their powers, offences and punishment therefor, defence available in certain circumstances to person charged where some other person is responsible, provisions as to samples, and substances to which the Act applied, viz., dinitro-phenols and their salts, dinitro-substituted phenols and their salts, organo-phosphorous compounds; preparations or mixtures containing any of the substances mentioned in the preceding paragraphs; and substances to which the Act for the time being applied by virtue of an exercise of powers conferred by sub-section (2) of section 9.

The Agriculture (Poisonous Substances) Act, 1952, is limited only to regulations that protect agriculturists in the field during spraying operations and matters connected therewith. In our view, however, a statute or statutes dealing with controls in the manufacture, storage, transport, distribution and use of insecticides may be enacted by the competent legislature making provisions to ensure effective protection to workmen employed in the factories where insecticides are manufactured, formulated or processed, providing for storage in suitable containers and, if deemed advisable, the constitution of an authority who may specify the nature of containers to be used, for precautions to be taken in the transport of insecticides and in that behalf compelling the consignor, whether the transport is by road, rail, air or

sea, to disclose in writing in a form to be prescribed the identity of the goods sought to be transported and the nature of the danger to which the goods give rise indicating at the same time to which of the categories the goods belong; further providing and making it obligatory upon every carrier, whether by road, rail, air or sea, to make provision for separate storage during transit so as to prevent contamination of other substances during the time when the insecticide remains in the custody of the carrier; providing a system of effective control on distribution, and for educating purchasers in the use of the insecticides and the precautions to be taken at the time of spraying operations and preliminary thereto as to protective clothing to be worn at the time of opening the containers, mixing or diluting the same and of spraying for washing facilities, working periods, supervision, prevention of taking meals in the spraying area, decontamination of machinery and equipment, etc. We also recommend that in the meantime the Indian Merchant Shipping Act, 1923, may, *ex abundanti cautela*, be amended so as to impose upon the shipper an obligation to expressly disclose the identity of the goods and the nature of the danger to which the goods give rise, indicating at the same time to which of the categories specified in rule 4 of the Indian Merchant Shipping (Carriage of Dangerous Goods) Rules, 1954, the goods belong. We also recommend that the penalty provided in section 225 of the Indian Merchant Shipping Act and under rule 12 of the Indian Merchant Shipping (Carriage of Dangerous Goods) Rules be enhanced so as to render possible, in grave cases, imposition of imprisonment for a substantial period for infringement of the obligations imposed by the Indian Merchant Shipping Act and the Rules made thereunder.

Special recommendation about disposal of foodstuffs attached by the Kerala State:

We are of the view that before any part of the foodstuffs which have been attached under orders of the State Government of Kerala can safely be released for consumption, representative samples from each bag or container should be obtained after a thorough mixing up of the contents of the bag or container in the presence of some health authority and subject to proper precautions in drawing the samples, and those samples must be subjected to independent tests in more than one laboratory and unless the findings are negative for parathion by the Averell and Norris tests as well as the spectrophotometric test and such other tests as the authorities may deem necessary to apply, the foodstuffs should not be permitted to be released for consumption.

We summarise our *general recommendations* as follows:

- (1) Control should be imposed by a comprehensive statute or statutes on the manufacture, storage, transport, distribution and use of insecticides which are regarded as highly toxic, especially dinitro-phenols and their salts, dinitro-substituted phenols and their salts, organo-phosphorous compounds and preparations or mixtures containing any one or more of the aforesaid insecticides; and substances to which the statute may, by notification to be made, apply.
- (2) Provision for regulations may be made under the statute for precautions to be taken in the matter of manufacture, formulation or processing of the insecticides in the matter

of providing protective clothing, facility for ventilation, in the factories supplying masks, eye-shields, rubber gloves and rubber aprons and washing facilities for all workmen employed in the manufacture, formulation or processing of the scheduled insecticides and for decontamination and care of equipment used in the application of the insecticides.

- (3) Regulations should be made for frequent medical examination of workmen engaged in the manufacture, formulation, processing or application of the insecticides.
- (4) Regulation should be made for supervision over the workmen during the process of manufacture, formulation, processing and application of insecticides, and for preventing the workmen from eating, drinking or smoking in the course of their work and in the area of application.
- (5) Other regulations for ensuring the safety of workmen against special hazard to the workmen incidental to their employment in the manufacture and application should also be made.
- (6) Regulation imposing an obligation upon the manufacturer, processor or formulator to store insecticides in special containers, and to use specified containers if the authority constituted in that behalf so directs.
- (7) Regulation for certification of suitable containers for insecticides by one of the national laboratories or other approved institutions should be made.
- (8) Regulations for provision of separate storage of insecticide in warehouses should be made.
- (9) In the matter of transport, we recommend that the Indian Merchant Shipping Act and the Indian Merchant Shipping (Carriage of Dangerous Goods) Rules, 1954, be amended by making it obligatory upon the shipper to make a declaration under Rule 4, and by providing a penalty of imprisonment for a substantial period for infringement of the rules. Similar provision should also be made requiring the consignor to make a declaration in writing as regards the identity of the goods, the nature of the danger to which the goods give rise, and indicating at the same time the category of poison even when the transport is by rail, road or air, and imposing penalty for breach of the same, and for separate storage when the insecticides are transported by rail, air, road or even boats.
- (10) The manufacturers and distributors should be licensed and be obliged to give necessary instructions to the purchaser of insecticides about the toxic quality of the insecticide sold by them, and to maintain record of the sales of the insecticides.
- (11) Regulation for providing labels for containers and packages in which they are stored and the forms thereof which give precise and adequate information to the persons dealing with the containers and packages of insecticides in conformity with the international recommendations in that behalf should be made.

- (12) Regulation for giving information to the health, agricultural and municipal authorities regarding the use of insecticides within their jurisdiction should be made.
- (13) Setting up of Pest Control Laboratories with special facility for study of insecticides, their properties, behaviour and effect, and for development of insecticides which are less toxic to human beings.
- (14) Provision of facility for training and education of all concerned in the matter of handling and use of insecticides, decontamination of equipment, and contaminated articles and disposal of containers.
- (15) Research in the matter of evolving protective devices in an effort to discover which equipment will give complete protection against contamination by insecticides without interfering with the comfort and safety of the workmen.

In the above recommendations we have used the expression "insecticide" in a generic sense as inclusive of pesticides, herbicides, fungicides, etc.

(J. C. Shah)
(Sarup Narain)
(T. B. Bose)

BOMBAY;
4th July 1958.

Monograph by Major General Sarup Narain on the Chemistry, Properties, use and Precautions to be taken in the use of 'Folidol'

The outbreak of food poisoning in this case has been shown to be due to the contamination of food-stuffs with 'folidol', whose active constituent is parathion—a very toxic organo-phosphorous compound used mainly as an agricultural pesticide. The terms of reference pertain specifically to food poisoning; therefore poisoning due to insecticides through vehicles other than food or from inhalation or absorption through the skin apparently does not strictly fall under the purview of this Commission. However, as the subject of toxic hazards of pesticides to man is a matter of great importance and is receiving universal attention, a somewhat broader interpretation has to be placed on para 2(e) of the Government of India Ministry of Health Letter so as to review not only the toxic effects of parathion, but also all pesticides that present an immediate danger or potential threat to the health of man and animals. Therefore, after considering the specific problem of prevention of recurrence of poisoning due to 'folidol' (parathion) general recommendations are also made on the reduction of health hazards in the manufacture, formulation, handling, transport and application of chemicals used as pesticides.

The term "pesticides" includes insecticides, fungicides, molluscides and herbicides.

Folidol.—This is an emulsion concentrate formulation of 'parathion', an organo-phosphorous insecticide. The active ingredient is 'parathion' and the emulsifying fluid is added for effective application and reduction of local toxicity. This compound has been widely used in agriculture in Europe and America, and it is considered to be extremely efficacious in crop protection. Organo-phosphorous compounds have not been used very much in public health for control of insect-borne diseases. However, their use is under consideration for control of those insects such as house fly which have become resistant to less toxic chlorinated hydrocarbons insecticides such as DDT, BHC, aldrin, dieldrin, etc.

Organo-phosphorous group of pesticides has a large number of compounds with different degrees of toxicity. Parathion (folidol), demeton and TEPP are the most toxic chemicals. Members of this group not only vary in their physical and chemical properties but mode of action on the pests as well. Parathion is a 'contact' poison. It is soluble in plant and animal lipid material, and due to this property get absorbed on the foliage of the plant and trees and skin of the fruits and thus can also act as a local 'systemic' insecticide. Parathion being fat-soluble gets easily absorbed into the surfaces it comes into contact with. It has, however, a very short residual effect as it is easily destroyed by hydrolysis, specially when deposited on living surfaces such as plants and trees. Other members of organo-phosphorous group of insecticides, which are comparatively more soluble in water, can act as true "systemic" insecticides. After absorption the compound gets translocated in various parts of the plant and the insects feeding on these get killed. The precise effects on the plant still remains unexplained.

Toxic Hazards.—Organo-phosphorous compounds get readily absorbed from the skin of animals and probably of man. The manufacturers of the formulation 'folidol' claim that by the addition of the emulsifying agent the absorption rate of parathion becomes slow and thus the general and local toxicity of the formulation is reduced to a large extent. Organo-phosphorous compounds are also toxic on inhalation during the operation of spraying or when ingested occupationally or through accident. The mode of action on the body is fairly well known. There is a general agreement that these compounds either directly in vitro or indirectly through their metabolites in VIVO as in case of parathion, inactivate the cholinesterase and thus allow the acetylcholine to persist at those nerve endings where it normally functions evanescently as transmitter of impulses. The fall in level of the blood cholinesterase is an index of the degree of intoxication with these chemicals.

The metabolism of 'parathion' (folidol) is not well understood but it seems probable that at least some of the thiophosphate ester is converted in the body into Para-Oxon which is a very active inhibitor of cholinesterase. The signs and symptoms of acute poisoning by all members of the organo-phosphorous group of insecticide are the same. The speed with which the intoxication follows depends upon individual compound. Exposure to TEPP may bring on symptoms almost immediately while exposure to parathion, unless very large quantities are consumed, leads to more gradual development of

symptoms. This is due to the fact that parathion has to be converted in the body into another compound which is an active inhibitor of cholinesterase. In most cases a fatal and non fatal poisoning in this outbreak the symptom appeared 1 to 4 hours after consumption of contaminated food or drink. The following compounds of this group are used in the field as insecticides. The table below gives the average single lethal dose for each compound when administered orally to male rats.

Insecticide.	Average single lethal doze mg/kg. body weight.
TEPP	2 mg.
Para Oxon	2 mg.
Dimefox	5 mg.
Sehradan	10 mg.
Parathion	15 mg.
Systox	15 mg.
Potosan	25 mg.
E P N	40 mg.
Malathion	1000 mgs.

(Table from W.H.O. Monograph Series 1953).

Toxic Hazards of certain Pesticides to Man by J. M. Barnes.

The following table indicates the acute toxicity of 'parathion' as compound to other insecticides and as determined by various workers.

Insecticide.	Acute Oral LD. 50			Lehman (1951) Ward (1954) Metcalf (1955)	Puri (1955)	Barnes (1953)
	WHO Group	Study (1956)	Lehman (1948)			
Parathion	3.6	13.0	3.5	6-15	2	15
DDT	113	118	250	250	250	..
Lindane	200	..	125	..	125	..
Dieldrin	46	..	..	..	87	..
Malathion	1000	1375	..	1400-5834	2103-3321	..
Diazinon	76	108	..	220-270	100	1000 mgs.

L.D. 50 (50 per cent lethal dose) for 'folidol' is not known but it can be theoretically deduced as it contains 46.7 per cent parathion.

Fatal dose of parathion for man is not known. Brown (1951) has quoted the case of Professor Velbinger who ingested 125 mg. of parathion and died before any aid could be given. Some expert evidence given before the Commission indicate that single fatal dose for man may be even smaller than this. Parathion appears to be pretty stable in 'folidol'. It has not been inactivated in foodstuff during storage, nor the high temperature used for frying 'purees' or banana fritters.

From medical evidence and depositions by other witnesses the effects of poisoning by 'folidol' can be conveniently separated into three groups:

- (a) Potentiation of para-sympathetic activity, i.e., contraction of muscles of the intestine, nausea, abdominal pain, vomiting and diarrhoea; constriction of bronchial muscles causing difficulty in breathing; increased secretion by secreting glands resulting in obstruction to breathing, excessive sweating and frothing from the mouth and nose. The heart rate is slowed and the pupils are contracted causing blurring of vision.
- (b) Persistent depolarization of the muscles of the body resulting in initial tremors followed by paralysis.
- (c) Initial stimulation followed by depression of central nervous system resulting in interference with respiratory nerves, convulsions and possibly later on paralysis of the respiratory centres and cyanoses.

It has now been shown that chronic poisoning can also be caused by this group of compounds. Prolonged administration or intermittent exposure of animal (cases have also been reported in man) can produce structural changes in the spinal cord and peripheral nerves. There is nausea, vomiting, headache and fatigue, and later on nervous symptoms appear. On post-mortem examination 'parathion' or its metabolites were not detected by the Chemical examiner in Viscera. There is nausea, vomiting, headache and fatigue, and later on nervous passages, and congestion of brain, and other organs. On microscopic examination no special histological changes were observed in the tissues of the body. In case of late poisoning with 'parathion', when there is paralysis of the extremities, there is demyelination of the spinal tracts, and degeneration of the motor cells in the anterior horn.

In spite of considerable amount of research work and prolonged observations on these chemicals, enough has not yet been known about their chemical and physical characteristics and their precise mode of action.

Treatment.—It is now well-known that atrophine is a specific remedy. The rest of the treatment consists of artificial respiration, administration of oxygen and other supportive treatment.

Pesticides in disease control and Crop Protection.—The widespread and increasing use of pesticides in the control of insects of medical importance and agricultural pests has been a great success. All these chemicals are inherently toxic. Therefore, public health

workers and agricultural authorities have a responsibility so that only the relatively safe and effective formulations are employed without endangering the health of man or animals. It is, therefore, very important that before any extensive use is made of pesticides in public health or agriculture, the toxic properties, mode of action, safe method of handling and application and treatment of poisoning with these compounds are known to operators and supervisory staff.

Toxicity is not necessarily a measure of health hazard as very toxic materials such as 'parathion' (folidol) have been used extensively with comparative safety. There have been casualties and even fatal accidents when proper precautions are not observed. The health hazard depends upon a large number of environmental and social factors. The incidents of poisoning have attracted a considerable amount of attention in several countries. Preventive measures to protect the worker and the users have been adopted through legislation and rules and regulations have been framed for enforcement through appropriate administrative authority. Regulations have been laid down in several countries [e.g., the U.K. Agriculture (Poisonous Substances) Regulations 1953], for protective measures during manufacture, for provision of protective clothing and other equipment for workers, for hours of work, records of material used and for arrangements for medical examination, supervision and surveillance of workers handling toxic material. The employer is also required to provide certain hygienic facilities and the worker is expected to obey the rules. Under the rules inspectors are also provided to advise and to supervise the enforcement of these measures. The rules and regulations for prevention or reduction of toxic hazard are generally simple to observe and easy to enforce, so that even a careless worker can understand them and take adequate precautions. Most of the reported accidents have been due to gross carelessness, lack of knowledge and lack of adequate training and experience in handling and application of the hazardous chemicals.

Public Health.—As already stated, pesticides have attained a great importance in public health and are playing a decisive role in the control and reduction of insect-borne diseases of man and animals. Most of the chemicals used for this purpose belong to chlorinated-hydro-carbon group and are of comparatively low order of toxicity. Since 1945 extensive use has been made of these chemicals in the control of malaria and other insect-borne diseases. Operators have been handling these compounds for a long period without suffering any acute or chronic ill effects. This state of affairs has actually created a false sense of security, as there have been cases of poisoning when the same group of workers handled more toxic compounds such as dieldrin. These accidents are entirely due to laxity in control and supervision and the development of a sense of complacency on account of safe handling chemicals of this group without any untoward effects for a long time. The handling and application of insecticides for public health purposes is well organised and is under adequate administrative and professional control by qualified people. It is for this reason that the supervision and enforcement of precautionary measures are reasonably satisfactory in this field.

Agriculture.—Insecticides and fungicides have been used for crop protection since 1880, and a very strong case has been made out for the need to use chemicals for pest control in agriculture. The risks to which the worker handling these compounds is exposed have been compared with the economics of agricultural production and the benefits conferred on the community. There is an overwhelming opinion in favour of their use as a small group of workers only is exposed and the risk is not very serious if adequate precautions are adopted. However, the method of application, the number of toxic compounds used and the environmental and social conditions are so diverse and variable in agriculture in our country that the use of pesticides presents a considerable hazards if strict precautionary measures are not observed under particular circumstances.

After study of various reports and published literature on the subject it appears that there is a consensus of expert opinion that provided reasonable precautions are taken, the use of present-day pesticides does not present any immediate or serious danger to the health of any group of workers, apart from gross carelessness in handling and application and accidental over-exposure. It is also agreed that safety in the use of pesticides in agriculture depends upon general principles of hygiene, education and training of the handlers and operatives.

Other Uses.—Insecticides are also used for protection of live stock from biting and non-biting insects which interfere with their growth, milk production or convey diseases. Sometimes chemicals are used to protect foodgrains from insect pests during transport and storage. Some residue may be left on the cereals and when these form the major part of the diet of a community the cumulative effect over a prolonged period may cause some toxic effects. The Organo-phosphorous compounds are also added to petrol (I.C.A.) and cases of poisoning amongst the operation have been reported.

Prevention and Reduction of Toxic Hazards.—The present day position is that larger quantity of pesticides under various conditions will be used for public health and in agriculture. The problem of health hazards by pesticide has become somewhat greater during the last few years owing to the increase in the quantity of material used and to increase in the variety of chemicals, especially with the introduction of new and more toxic materials. Every country is conscious of this. Since 1951 the WHO have maintained an active interest in this problem and a 'Study Group on Toxic Hazards of Pesticides to Man' was formed. Their collective views on this problem have been published in various WHO monographs. The study group included the representatives of FAO and ILO to enable it to consider more fully the problem of interest to those organisations in this field.

Exposure of pesticides can occur in four ways.—(a) Occupational exposure of industrial workers in factories where chemicals are produced, formulators, operators and handlers including agricultural workers exposed to residues on treated crops.

(b) Accidental exposure from ingestion, spillage or some other mishap with toxic materials at home in the field or in any other place.

(c) A large number of residual insecticides are used inside the houses for vector control and some of these may enter the body through inhalation or ingestion.

(d) Consumption of contaminated food. Insecticides in small quantities may be consumed when these chemicals are used in the production or preservation of foodstuffs.

Public health, agriculture labour and Shipping legislations are available in most countries and provide a guide on the safe use of the chemicals. In some countries the governmental control on pesticides is more elaborate than in others. In more advanced countries there is close collaboration between the manufacturer and the State. Precautionary labelling indicating the degree of risk to the user is compulsory in certain parts of the world. A labelling scheme is now under development by the ILO and the United Nations Committee of Experts on Transport of Dangerous Goods. These recommendations have also been accepted by our Government and Indian Merchants Shipping (Carriage of Dangerous Goods) Rules have been issued in 1954. In the last few years certain countries have given consideration to the problem of pesticidal residues in food products and some regulations have already been put into effect to establish and control such residue.

The existing legislation should be utilised to the maximum for recommending preventive measures. This advice from international bodies such as WHO, ILO, and FAO, should be asked for, if new comprehensive regulations have to be framed.

In the light of the present day knowledge of toxicity and mode of action of pesticides, certain regulations have been suggested by experts and the international agencies for control of hazards in the manufacture, handling and application. The Model Code of Safety Regulations for Industrial Establishments (International Labour Organisation 1954) for the guidance of governments and industry, prepared by the ILO contains a section on the manufacture and handling of toxic chemicals. This might be of value in setting up basic labour legislation in relation to the manufacture and handling of pesticides.

In some countries there is registration of pesticides and adequate labelling coupled with some restrictions on distribution to the public of more toxic substances. Other countries are opposed to the system of registration. In the opinion of the Study Group of Toxic Hazards of Pesticides to Man (WHO) Technical Report (Series No. 114 of 1956), labels should provide the following information as a minimum:

- (a) The name of the manufacturer;
- (b) The common name as recommended by the appropriate committee of the International Organization for Standardization;
- (c) The type of formulation, with concentration of ingredients;

- (d) The recommended uses and where appropriate, cautions against undesirable applications;
- (e) The basic precautions to be employed;
- (f) A suitable indication of hazard, including a pictorial symbol for highly toxic substances; and
- (g) The recommended treatment in case of intoxication.

Regulations for control of residue in treated food.—All experts support the principle that residues on food should be controlled and regulation should be available relating to the amount of pesticide applied and to the period between the last application of the insecticide and the date of harvest. It is, however, realised that it is difficult to ensure that the agriculturist and horticulturist will comply with these rules.

Conclusion.—It appears that control through regulations is absolutely necessary to avoid and reduce health hazards. Enlightened self interest will dictate a cautious attitude at present towards indiscriminate use of pesticides. Without adequate administrative and scientific facilities for implementation the most modern regulation cannot reduce the hazards. When insecticides are used for Vector control in public health, the operations are normally under the charge of health authorities and thus medical advice and supervision is always available. Specification for insecticides and equipment have been drawn up by WHO and are in a continuous process of revision in the light of latest developments. When highly toxic pesticides are used in agriculture, for crop protection; there is no organised medical control over these operations. During the course of this inquiry it was observed that the agricultural departments of Madras and Kerala, Estate owner and agriculturist in those States were freely using large quantities of 'folidol' without adequate administrative and scientific control. No attempts have been made to make laboratory and field observations on the effects of these chemicals on plant, live stock and men. It was deposed before the Commission that no death and severe illness has occurred amongst the operators; nor any accidental exposure been reported. Dr. Natarajan, Chemical Examiner to the Government of Madras, who has been specially interested in poisoning due to insecticides, deposed that since 1954 he has diagnosed 25 cases of poisoning due to organo-phosphorous group of chemicals during the course of his routine work. If this is so, then it is possible that there may have been more cases which remained undetected or undiagnosed. These deaths may be accidental, homicidal or suicidal. Dr. Natarajan was asked to collect detailed medical data, collate the material and analyse the results. It was also observed that although extensive use of organo-phosphorous compound is being made the local medical practitioners are not conversant with the toxic effects of these chemicals, and the diagnoses of poisoning and its treatment. This aspect of the problem is considered to be the collective responsibility of agricultural and health authorities. No attempt in these States have been made to standardise the spraying equipment; the precautions to be adopted during the operation of spraying and for proper storage and disposal of containers. There is no intention to discourage the use of pesticides in agriculture, and in the present circumstances for economic reasons

calculated risks have to be taken, but it is very important that while using potentially dangerous materials, reasonable control is exercised for reduction of hazards and accidents. Legislation, Regulations and Rules are of little practical help if administrative and scientific organisation is not available for implementation of rules or enforcement of legislation. Agencies should be available in the field for training and education of farmers in the safe application of hazardous chemicals.

Extensive laboratory and field enquiries are necessary for the safe and economic use of pesticides. From the evidence of Pest-control Officer and Agricultural experts it appears that no attempt is being made for scientific appraisal of the effects of pesticides on crop and hazards to men and live stock. There is a great scope to study this under various environmental conditions in all parts of the country. It is appreciated that at present we have not got adequate resources in scientific manpower nor the elaborate laboratory facilities for research and control. However, it will be profitable to establish a nucleus of facilities to study this problem by collaborating with international agencies and by collection of scientific information from published literature. The information and scientific data can be disseminated to all concerned. However, even with limited resources field inquiries should be planned and prosecuted on established scientific lines for critical evaluation of the pesticides used in agriculture in our country.

Summary.—(a) In the present state of our social and economic conditions and educational standards a cautious attitude towards the use of highly toxic pesticides is advisable.

(b) Use of highly poisonous pesticides in agriculture is more hazardous than in public health.

(c) Until some harmless alternatives are found the use of organo-phosphorous and other pesticides shall have to continue as the importance of higher agricultural production in our national economy needs no emphasis.

(d) All practical measures should be adopted to protect the workers.

(e) Comprehensive regulations should be framed for reduction of health hazards during manufacture, handling, transport and application of pesticides.

(f) There should be authority for scientific and administrative control of the protective measures.

(g) The regulations on protective measures for workers should include (i) provision of protective clothing; (ii) washing facilities; (iii) limitation of working hours; (iv) prohibition of taking meals or smoking while working; (v) decontamination and care of spraying equipment.

(h) Whenever toxic pesticides are used the local health authorities and medical practitioners should be warned regarding the use of new pesticides, their toxic effects and treatment.

(i) The containers and packing cases should be properly labelled in accordance with international requirements.

(j) Facilities should be available and all measures instituted to train and educate the operators, cultivators and other workers employed in handling, transportation and application of toxic chemicals.

(k) Facilities for laboratory and field research on the use of pesticides should be progressively expanded.

APPENDIX I

LIST OF WITNESSES EXAMINED BEFORE THE KERALA AND MADRAS FOOD-POISONING COMMISSION AT BOMBAY, ERNAKULAM AND TRIVANDRUM

S. No.	Name of witness	Evidence at Page No.
<i>Bombay</i>		
1.	Capt. M. S. Patel	1
2.	Mr. Subbarao.	2
3.	Mr. D. N. Nakate	10
4.	Mr. V. V. Dabke	16
5.	Mr. J. N. Joshi, Assistant Collector of Bombay Customs	26
6.	Mr. M. L. F. Fernandes of Port Trust	27
7.	Mr. H. J. Hedge of Port Trust	28
8.	Mr. S. N. Deshpande of Port Trust	29A
9.	Mr. K. R. Vasavada, Secretary	30
10.	Mr. Rasiklal Harijivandas, Assistant Manager	32
11.	Mr. M. S. G. Sayed of Port Trust	37
12.	Mr. T. V. Krishnan of Dholera Co.	38
13.	Mr. P. C. Purushottam " "	41
14.	Mr. Bhailal T. Kotak " "	43
15.	Mr. L. Cooverjee " "	44
16.	Mr. G. Kaimal " "	45
17.	Mr. P. P. Shandyl " "	48
18.	Mr. A. A. Jaffer (Capt.) " "	50
<i>Ernakulam</i>		
19.	Mr. Narayan K. Nair	52
20.	Mr. Chakkapan	53
21.	Mr. Varid	54
22.	Mr. Kochapu	55
23.	Mr. Chakuni	56
24.	Mr. Kochumni Menon	57
25.	Mr. Allakaparampatti Kittu	58

S. No.	Name of witness.	Evidence at Page No.
Ernakulam—contd.		
26.	Mr. C. V. Anthony	59
27.	Mr. M. Paramshevaran	60
28.	Mrs. Gomati	61
29.	Mrs. Chirakuti	62
30.	Mrs. Kochamu	63
31.	Dr. K. Thomas	64
32.	Dr. S. B. Rao	65, 66
33.	Mr. Kumaran	67
34.	Mrs. Koushalya	68
35.	Mr. Joseph	69
36.	Mr. Natarajan	70
37.	Mr. Rajan	71
38.	Mr. Agustin	72
39.	Mr. William D. Almedia	73
40.	Mr. John Thomas Poruthookaran	74
41.	Mr. Kunju Krishna Menon	75
42.	Mr. U. P. R. Menon	76
43.	Mr. K. Menon	77
44.	Dr. K. K. Thamburan	78
45.	Mr. Vasudevan Nambudri	79
46.	Dr. Thoman	80
47.	Mr. Poullose	81
48.	Mr. Ravi	82
49.	Mr. Kumjan	83
50.	Mrs. Thresia	84
51.	Mr. Velayudhan Vaidyan	85
52.	Mrs. Parvati	86
53.	Mr. Keshavan	87
54.	Mr. Appu Velayudhan	88
55.	Mr. V. Gopalan	89
56.	Mr. C. S. Raman Pillai	90 to 94

Sr. No.	Name of witness	Evidence at Page No.
<i>Ernakulam—contd.</i>		
57.	Dr. Raman Kutty Pannicker	95, 96
58.	Dr. Joseph	97
59.	Dr. Punnan	98
60.	Mrs. Thangama	99
61.	Mr. Raman Menon	100
62.	Mr. Varkey Devasy	101-102
63.	Mr. Philipose	103-104
64.	Mrs. Annama	105
65.	Dr. Kumaran	106-107
66.	Mr. Lawrence	108
67.	Mr. T. C. Varkey	109 to 116
68.	Dr. P. V. Thomas	117, 118
69.	Dr. M. P. M. Nambiar	119, 120
70.	Mr. M. K. C. Nair	121 to 124
71.	Mrs. Sarasvati	125
72.	Mr. Kundan	126
73.	Mr. Hansa	127
74.	Mr. Ramu	128, 129
75.	Mr. Habib	130
76.	Mr. Moolchand M. Shaha	131 to 134
77.	Mr. Ratansey Panchan	135 to 140
78.	Mr. Fernandez	141-142
79.	Mr. Kurup	143-144
80.	Mr. Hansa	145, 146
81.	Mr. Mohamed Ali	147
82.	Mr. Alexander	148
83.	Mr. Moolji Cooverjee	149-150
84.	Mr. Sivan	151, 152
85.	Mr. Shrinivasan	153 to 157
86.	Mr. Devasey	158 to 160

Sr. No.	Name of witness.	Evidence at Page No.
<i>Ernakulam—contd.</i>		
87.	Mr. Latif	161
88.	Mr. K. K. Raghavan	162-164
89.	Mr. Matthews	165-166
90.	Mr. K. R. Mehta	167-168
91.	Mr. Menon	169, 170.
92.	Mr. Chakoni	171
93.	Mr. Anthony	172
94.	Mr. P. S. Vishnu	173
95.	Mr. N. N. Konnar	174
96.	Mr. Xavier	175
97.	Mr. Bhaskaran Marar	176-177
98.	Mr. Bhaskaran Panikkar	178-179.
<i>Trivandrum</i>		
99.	Dr. A. R. Natarajan	180-185
100.	Mr. C. J. Selvaraj	186-192
101.	Dr. N. K. Iyengar	193-195
102.	Dr. Miss Anand Laxmi	196-197
103.	Dr. Mrs. Leela Mani	198
104.	Mr. Sayed Kasim	199
105.	Mr. Bhagavan	200
106.	Mr. Subramanyama, accountant	201
107.	Mr. Matechan Fernandez	202
108.	Mr. J. K. Fernandez	203
109.	Mr. Mohamed Kunju Ibrahim Kunju	204
110.	Mr. Krishna Janardan	205
111.	Mr. Abdul Rahiman	206
112.	Mr. Kuttu Gopalan	207
113.	Mr. U. N. Subramanyam	208
114.	Mr. Madhavan Pillai	209
115.	Mr. Rajaram	210

Sr. No.	Name of witness	Evidence at Page No.
<i>Trivandrum—contd.</i>		
116.	Dr. M. J. Menon	211
117.	Mr. Mohiuddin Md. Abdulla	212
118.	Mr. Subbya Chettiar	213
119.	Mr. Sultan Pillai Shamsudin	214
120.	Mr. Narayan Gangadharan	215
121.	Mr. Chellapan Pillai	216
122.	Mrs. Panchakashari	217
123.	Mrs. Saraswati	218
124.	Mr. Nair	219
125.	Mr. K. L. Pilai	220
126.	Capt. Williams	221 to 224
127.	Mr. P. D. Nair, Director of Agriculture	225-229
128.	Dr. K. O. Ooemen.	230
129.	Dr. Surendhranath	232
130.	Mr. Alexander	234
131.	Mr. P. S. Krishna Nair	235
132.	Mr. Gopal Pillai	236
133.	Mr. Md. Hassan	238
134.	Mr. Ram Varrier	239
135.	Mr. Nanu Panikkar	240
136.	Mr. T. Yohhanna	241
137.	Mr. U. N. Subramanya, C. I.	242
138.	Mr. G. K. Kurup	243
139.	Dr. Karunakaran Nair	244
140.	Dr. Varrier	245
141.	Dr. Parera, Chemical Analyser to Kerala Govt.	249
142.	Dr. Janardan, Public Analyst	251
143.	Mr. Subramanyan, S. I. of Police	253

Sr. No.	Name of witness.	Evidence at Page No.
<i>Bombay</i>		
18.	Capt. A. A. Jaffer (Continued)	51A
144.	Mr. T. G. Punwani	254
145.	Mr. M. B. Gidwani	258
146.	Mr. L. R. Shevde	261
147.	Mr. Noor Mohammad Noor Hasan	266
17.	Mr. P. P. Shandy	269
77.	Ratansey Panchan	273
148.	Mr. S. T. Bhansali	274
9.	Mr. K. R. Vasavada	279
149.	Dr. H. R. Manji	281
2.	Mr. Subba Rao	283
9.	Mr. K. R. Vasavada	286
150.	Mr. H. E. W. Bernhardt.	287

APPENDIX II

LIST OF EXHIBITS PRODUCED BEFORE THE COMMISSION.

Sr. No.	Name of the witness	Exhibits	Particulars
<i>Bombay</i>			
1	M. S. Patel	Ex. A.	Circular, dated 20-7-1955 issued by the Under Secretary to the Government of India.
	Do.	Ex. B	Circular, dated 23-8-1955 issued by the Principal Officer, Mercantile Marine Department, Bombay.
	Do.	Ex. B-1	Copy of Ex. B received by the Dholera Steamship Co.
	Do.	Ex. C.	Blue Book (Report of the Committee on the Carriage of Dangerous Goods).
2	Mr. Subbarao	Ex. D.	Two brochures of literature of Folidol (Collectively).
	Do.	Ex. E	Original letter from Plant Protection Department of Chika Ltd. to V. V. Dabke, dated 19-3-1958.
	Do.	Ex. F.	Bombay Port Trust Chhapa No. 245 (Shipping Bill No. 2959, dt. 21-2-).
	Do.	Ex. G.	One copy of Shipping Bill No 1219, dated 20-3-1958.
4	Mr. V. V. Dabke	Ex. G-1	Three copies of Shipping Bill No. 1219, dated 20-3-1958.
2	Mr. Subbarao	Ex. H.	One crate with Carboy.
	Do.	Ex. I	Two copies of Bill of lading No. 233, dated 27-3-1958.
10	Mr. Rasiklal Harjivandas	Ex. I-1	Another copy of the Bill of Lading No. 233.
		Ex. I-2	Original of the Bill of Lading No. 233.
4	Mr. V. V. Dabke	Ex. J	Measurement Certificate by Indian Merchants' Chamber, dated 24-3-1958.
	Do.	Ex. K.	Mate's receipt dt. 27-3-1958.

Sr. No.	Name of the witness	Exhibits	Particulars
<i>Bombay—contd.</i>			
4	Mr. V. V. Dabke	Ex. L	14 Bills of Lading of Import (one showing poisonous) by ship.
5	Assistant Collector of Customs (N. Joshi).	Ex. M	Export General Manifest.
7	H. I. Hegde	Ex. N	Export Cargo Register of Port-Trust.
8	S. N. Deshpande	Ex. O	Port Trust Tally Sheet (Deshpande).
11	M. A. G. Syed	Ex. O-1	Port Trust Tally Sheet (Sayed)
	Do.	Ex. O-2	Port Trust Tally Sheet (Prabhū).
9	M. R. Vasavda	Ex. P	The Scheduled rates of Conference (Pages 73, 74, 75 of Book I).
10	Rasiklal Harjivandas	Ex. Q	Cargo Plan written by G. K. K. . . .
		Ex. Q-1	Cargo Plan written by A. A. Jafar, dated 4-5-58.
14	Bhailal Kotak	Ex. R	Tally sheets of Dealers Co. (Seven sheets).
15	L. Cooverji	Ex. S	Loading Memo of Cargo of S.S. Jai Hind.
<i>Ernakulam</i>			
21	Mr. Varid	Ex. T	Bill of Purchase of Rava, dt. 19-4-1958 from Mane & Co.
22	Mr. Kochappa	Ex. U	Bill of purchase of flour No. WF/S/84/3422, dt. 26-3-1958, from Wallace Flour Mill, Bombay, (S.S. Jai Hind).
	Do.	Ex. U-1	Entry from a Register of Mane & Co., regarding Voyage No 166 of S. S. Jai Hind.
26	Mr. C. V. Anthony	Ex. V	One torn Cash Memo from Mane and Co., then supplied to the Lodge.
31	Dr. K. Thomas	Ex. W	Two reports of Post Mortem Examination of two dead bodies Lohitakshna and Radha on 23-4-1958.
39	Mr. William D'Souza	Ex. Z	Cash memo from John Thomas Poruthooka ren and Bros. No 19634, dated 10-4-1958.
40	Mr. John Thomas Poruthookaren.	Ex. Z-1	Cash Memo from Meghji Malsi and Co. dt. 7-4-1958.

Sr. No.	Name of the witness	Exhibits	Particulars
<i>Ernakulam—contd.</i>			
41	Mr. Kunju Krishna Menon.	Ex. Z-2	Copy of Chemical Analyser's report regarding Parathion No. 425, dt. 12-5-1958.
	Do.	Ex. Z-3	Do. No. 429, dt. 12-5-1958.
43	Mr. K. Menon	Ex. Z-4	Carbon copy of inquest report on two dead bodies at Village Elkiso, dt. 23-4-1958.
44	Dr. K. K. Taamburan	Ex. Z-5	Post-Mortem Exam. Notes on Bharati of Trichur Town Police Station No. 94, dated 23-4-1958.
46	Dr. Thoman	Ex. Z-6	Telegram dt. 16-4-1958 regarding outbreak of Cholera from Director of Health.
57	Dr. R. Pannicker	Ex. Z-7	Post Mortem Notes on Hari and Govind dt. 20-4-1958.
	Do.	Ex. Z-8	Certificates of Chemical Analyser Nos. 513 and 512, dt. 9-6-1958.
	Do.	Ex. Z-9	Letter from Medical Officer, Tripoonithose to Police, dated 19-4-1958.
63	Mr. Philipose	Ex. Z-10	Mazhar (Panchnama) dated 19-4-58 regarding attachment of 107 Lbs. and 12 bags of Sugar.
	Do.	Ex. Z-11	Copy of Chemical Analyser's report No. 485, regarding samples of Sugar.
65	Dr. Kumaran	Ex. Z-12	Post Mortem Notes on Rosi No. 54, dated 9-6-1958.
	Do.	Ex. Z-13	Post Mortem Notes on Prakasam No. 53, dated 9-6-58.
	Do.	E. Z-14	Extract copy from Chemical Analyser's report No. G/155/58, dt. 12-6-1958.
67	Mr. T. C. Warkey	Ex. Z-15	Letter to Thomas from Chika, dt. 31-3-1958.
	Do.	Ex. Z-15 (1)	Letter from A. V. Thomas to Chika, dated 10-4-1958.
	Do.	Ex. Z-16	Copy of telegram, dated 10-4-58.
	Do.	Ex. Z-17	Copy of letter to Pierse Leslie & Co. dated 16-4-58, from A. V. Thomas & Co., regarding survey of 15 cases.

Sr. No.	Name of the witness	Exhibits	Particulars
<i>Ernakulam—contd.</i>			
67	Mr. T. C. Warkey . . .	Ex. Z-17 (1)	Original of above dated 16-4-1958
	Do. . . .	Ex. Z-18	Letter from Plant Protection Department of Chika dated 24-4-58 regarding damage of cases.
	Do. . . .	Ex. Z-19	Letter from Thomas No. 2487, dated 26-4-1958.
	Do. . . .	Ex. Z-20	Original application for survey, dated 16-4-58 addressed to Loyds.
70	Mr. M. K. Nair . . .	Ex. Z-21	Letter from Pierce Leslie & Co. to Dholera Steamship Co., dated 17-4-1958.
	Do. . . .	Ex. Z-21 (1)	Reply from New Dholera Steam Ship Co., dated 30-4-1958.
	Do. . . .	Ex. Z-22	Survey report of Pierce Leslie & Co. held on 23-4-58 and issued on 13-5-58.
	Do. . . .	Ex. Z-23	Rough notes of survey in the hand-writing of M. K. C. Nair, the Surveyor.
74	Mr. Ramu	Ex. Z-24 (Colly.)	Three cash Memos. from Meghi Malsi (i) No. 14407, dated 19-4-58, S. S. Jai Hind. (ii) No. 14175/15-4-58, S. S. Jai Hind. (iii) 14808, dated 30-4-58, S. S. Jaladhara.
75	Mr. Habib	Ex. Z-25	Chemical Analyser's report No. 591, dated 11-6-1958.
76	Mr. Moolchand M. Shah	Ex. Z-26	Invoice of 150 bags of Wallace Flour Mill (Anchor Wheat) WF/S/84/3400/25-3-58.
	Do. . . .	Ex. Z-27	True copy of Invoice of sale of Maida bags to John Thomas Purthukuran No. 4979/57/58, dated 7-4-1958.
	Do. . . .	Ex. Z-28	Bill of lading No. 182 by S. S. Jai Hind, dated 27-3-1958.
	Do. . . .	Ex. Z-29	Bill of lading No. 181, 54 bags, 51 bags of Sugar and 3 Jatta by S. S. Jai Hind.
	Do. . . .	Ex. Z-30	Copy of Invoice 5037/57-58, dated 14-4-1958 of 2 bags of Sugar.
	Do. . . .	Ex. Z-31	Copy of Cash Memo No. 14499/24-4-58 for 1 bag of Sugar at Rs. 107-8-0.

Sr. No.	Name of the witness	Exhibits	Particulars
<i>Ernakulam—contd.</i>			
76	Mr. Moolchand M. Shah	Ex. Z-32	Invoice No. WF/S/84/3401, dt. 25-3-1958 regarding 50 bags of Anchor Wheat Pollards.
	Do.	Ex. Z-33	Copy of Invoice No. 4987/57/58 from Meghji Malsi, dt. 9-4-1958.
77	Ratansy Panchan	Ex. Z-34	Import General Manifest.
	Do.	Ex. Z-35	Boat Notes (30) collectively.
	Do.	Ex. Z-36	Cargo Landing Book (Page 102).
	Do.	Ex. Z-37	Page 101 of Cargo Landing Book.
	Do.	Ex. Z-38	Delivery order dt. 2-4-58, Folidol E-605 Liquid with list of damaged cases on reverse.
	Do.	Ex. Z-38 (1)	Marking on reverse identification of Sivam.
78	Albert Fernandez	Ex. Z-39	Tally Clerk, Karup's register of Match No. 1.
79	Kurup	Ex. Z-39 (a)	Two pages dt. 2-4-58 of Z-39.
	Do.	Ex. Z-39 (b)	Page mentioned word 'Chika' in Z-39. (Refer to Opposite page).
	Do.	Ex. Z-39 (c)	Page marking three bags stained of tobacco.
84	Shivam	Ex. Z-40	Survey book of New Dholera Steam Ship Co.
	Do.	Ex. Z-41	Page No. 103 of Tariff Schedule.
85	Shrinivasan	Ex. Z-42	Statement of Sales of Folidol by A. V. Thomas sold in the years 1954 to 1958.
	Do.	Ex. Z-43	Statement of quantity of Folidol E-605 cleared through Cochin year by year.
87	Inspector Latif	Ex. Z-44	Report of Inspector Abdul Latif to I. G. P. regarding Kozikode, Palghat, Cannanore cases.
89	Sub Inspector Methews	Ex. Z-45	Portion of the Diary of S. I. Methews of Mattanchery regarding Notes about visit to Malabar Steamship Godown.

Sr. No.	Name of the witness	Exhibits	Particulars
<i>Ernakulam—concl'd.</i>			
89	Sub Inspector Methows	Ex. Z-46	Original Chemical Analyser's report regarding Rosi No. 390, dated 11-6-58.
90	K. R. Mehta	Ex. Z-47	Statement regarding cleared value of Cargo by S. S. Jai Hind Voyage No. 166.
91	Govind Menon—Principal of Maharaja College.	Ex. Z-48	Office copy of Chemical Analyser's report made by Principal of Maharaja College.
92	Mr. Chakoni	Ex. Z-49	Invoice No. 177, dated 28-3-58, from Jos Thomas Mookerji to Mooken Devassey Ouseph and Sons.
	Do.	Ex. Z-50	Invoice of Mooken Devasey Ouseph dt. 7-4-1958.
	Do.	Ex. Z-51	Invoice : M/s. Chaganial Khimji & Co., dated 26-3-58 (100 bags of Maida-Rava).
	Do.	Ex. Z-52	Invoice of Mooken Devassay Ouseph No. 3557, dt. 19-4-1958
93	Mr. Anthony	Ex. Z-53	Invoice : True copy CLV bros. 9-4-58 from Maneklal Bhagwanjee No. 2165, dated 9-4-1958 to Gopal Pillai.
	Do.	Ex. Z-54	Invoice copy of Maneklal Bhagwanji Merchant A-7608, dated 8-4-58 C. L. V. Brothers.
94	Mr. P. S. Vishnu	Ex. Z-55	Invoice of Wallace Flour Mills WF/S/84/4322, dt. 26-3-58 (with a true copy).
95	Mr. N. N. Konnar	Ex. Z-56	Carbon copy of Cash Memo No. 450, dated 3-4-58 issued by N. N. Konnur to S. D. K. Parmeshwaran Pillai.
<i>Trivandrum</i>			
99	Dr. A. R. Natarajan	Ex. Z-57	Letter received from the Director of Health Services, Trivandrum, dt. 30-4-58 sent with samples etc. No. 7199/58/D.H.S.
[[See Z 95 (1)]	Do.	Ex. Z-58	Letter dt. 9-5-58 to Director of, Health Services, Trivandrum Kerala State.
	Do.	Ex. Z-59	Letter to Dr. Natarajan, dt. 5-5-58, with letter No. 2738/548, HP. 432/9-5-58.

S. No.	Name of the witness	Exhibits	Particulars
99	Dr. A. R. Natarajan	Ex. Z-60	Letter from O. C. Comd. Pathological Laboratory No. 233, dated 4-5-1958.
	Do.	Ex. Z-61	Copy of reply to O. C. Command, Pathological Laboratory, South. Bangalore-7, No. 2823/58, by Chemical Analyser H.P. 430/8-5-58 from Dr. A. R. Natarajan.
	Do.	Ex. Z-62	Letter of Lt. Col. AMC Commander, Military Hospital, St. Thomas Mount, Madras 16, dt. 2-5-58 to Chemical Analyser.
	Do.	Ex. Z-63	Copy of letter dt. 5-5-58 from the Chemical Analyser.
	Do.	Ex. Z-63(1)	Final report of (63), dt. 8-5-58.
	Do.	Ex. Z-64	Copy of letter from Military Hospital, St. Thomas Mount, Madras, E/7-A, dt. 9-5-58 to Chemical Examiner regarding vessels used.
	Do.	Ex. Z-65	Copy of reply to E/7-A, dt. 9-5-58, to Military Hospital by Chemical Examiner.
	Do.	Ex. Z-66	Letter from District Collector and Additional Dist. Magistrate, Quilon dt. 6-5-58 with list of articles to Chemical Analyser, Madras.
	Do.	Ex. Z-67	Report of Dr. Natarajan on the Analysis on the samples sent under Ex. Z-66.
100	Mr. Selvaraj Plant Pro. Deptt., Kerala.	Ex. Z-68	Book issued by Kerala State in 1957 regarding use of Folidol.
	Do.	Ex. Z-68(a)	Instructions in Malayalam reg. use of insecticides issued by the Government of Kerala.
	Do.	Ex. Z-69	Instructions given to staff on the precautions to be taken during spraying.
	Do.	Ex. Z-70	One Alluminium Container of Folidol E-605.
	Do.	Ex. Z-71	Further instructions to staff regarding use of Folidol E-605 No. C/3-248/58, dt. 5-5-1958.

Sr. No.	Name of the witness	Exhibits	Particulars
101	Dr. Iyengar	Ex. Z-72	Letter from Mr. Bhaskaran, Joint Director I. B. to Dr. Iyengar information regarding samples sent.
	Do.	Ex. Z-73	Copy of reply from N. K. K. Iyengar dt. 3-6-58 to Jt. Director of I. B.
	Do.	Ex. Z-74	Letter from C. I. O. Trivandrum No. 126/DS/Fd/58, dt. 29-5-58 to Dr. Iyengar.
	Do.	Ex. Z-75	Copy of letter to Jt. Director Information Bureau, Dr. Bhaskaran from Iyengar, dt. 5-6-58.
102	Dr. Miss Anand Luxmi	Ex. Z-76	Copy of P. M. Notes of Harifa Bibi dt. 26-4-1958.
	Do.	Ex. Z-77	Copy of P. M. Notes of Soman dt. 26-4-58.
	Do.	Ex. Z-78	Copy of Chemical Analyser's report No. 447/15-5-58.
	Do.	Ex. Z-79	Copy of Chemical Analyser's report No. 521/7-6-1958.
103	Dr. Leela Mani, Asstt. Surgeon General Hospital, Trivandrum.	Ex. Z-80	Copy of P. M. Notes of Shivan Chettier, s/o Shanmagaon on 1-5-1958 (521/7-6-58).
	Do.	Ex. Z-81	Copy of Chemical Analyser's report No. 447, dt. 13-6-58.
106	Subramanyam, Accountant of SOK Parmeshwaran Pillay.	Ex. Z-82	Carbon copy of Cash Memo. of Maida No. 5358.
	Do.	Ex. Z-83	Invoice of Naisadhkumar and Co. 19, Nafees Chaubess, 5th floor, Carnac Road, Bombay-1, No. 149/7. dt. 25-3-58 by S. S. Jai Hind.
	Do.	Ex. Z-84	Cash Memo N. N. Konar, 12-9-1133 for sale to SDK Parameshwaran Pillai.
	Do.	Ex. Z-85	Cash Memo No. 5262/27-6-1133 reg. sale of bag.
	Do.	Ex. Z-86	Boat Note No. 450/3-4-58 of N. N. Konar of Mattarcherry came from S. S. Jai Hind.
	Do.	Ex. Z-87	Report to Sales Tax Officer by SPK Parameshwaran Pillai, dt. 10-5-58 regarding sales.

Sr. No.	Name of the witness	Exhibits	Particulars
113	U. N. Subramaniam	Ex. Z-88	Copy of Chemical Analyser's report No. 606/12-6-58.
	Do.	Ex. Z-89	Copy of P. M. Certificate of Michael Fernandez, dated 28-4-58.
	Do.	Ex. Z-90	Copy of P. M. Certificate of Stalin Fernandez, dt. 28-4-58.
	Do.	Ex. Z-91	Do. of Raphi dt. 28-4-58.
	Do.	Ex. Z-92	Copy of Chemical Analyser's report No. 573/11-6-1958.
	Do.	Ex. Z-93	Copy of Chemical Analyser's report No. 520/13-5-58 (flour bags).
116	Dr. M. J. Menon	Ex. Z-94	Copy of M. M. Notes of one Rajgopalan Nair No. 27, dt. 30-4-1958.
124	S. I. B. Nair	Ex. Z-95	Report of Chemical Examiner, Kerala No. 522/5-6-1958 (Food-stuffs.)
(See Z-58)	Do.	Ex. Z-95 (1)	Copy of report of Chemical Examiner, Madras, No. 2738/53, H. P. 452, dt. 9-5-1958.
125	K. L. Pillai	Ex. Z-96	Copy of Chemical Analyser's report No. 511/12-6-1958.
128	Dr. K. O. Oomoen	Ex. Z-97	(i) True copy of letter from R. M. O., District Quilon to Chemical Examiner, Trivandrum. (ii) Copy of Chemical Examiner's report No. 446/58, dated 13-5-58.
129	Dr. Surendra Nath	Ex. Z-98	P. M. Certi. No. 15/5859, dated 30-4-58.
	Do.	Ex. Z-99	Copy of certificate of Chemical Analyser No. 443/14-5-58.
130	Clerk Alexander	Ex. Z-100	Copy of page 170—Report of Ration Account of Sastamkottah.
	Do.	Ex. Z-101	Copy of Memo Book of report of Dry and Fresh provision.
	Do.	Ex. Z-102	Copy of page of issue of Atta to staff and ABC Co. dated 28-4-58.
133	Dy. S. P. Quillon, Mr. Hasan.	Ex. Z-103	Copy of Chemical Analyser's report No. 441/442, 12-5-1958.

Sr. No.	Name of the witness	Exhibits	Particulars
137	Circle Inspector Mr. U. N. Subramaniam.	Ex. Z-104	Photographs of dead bodies.
	Do.	Ex. Z-105	Report to D. M. Quilon by Circle Inspector Quillon.
138	S. I. Karuna Karan Kurup	Ex. Z-106	List of 65 deaths at Sastan-kottah.
141	Dr. Pareira, Chemical Analyser, Govt. of Kerala.	Ex. Z-107(1)	Copy of Chemical Analyser's report.
		Ex. Z-107(2)	Do.
		Ex. Z-107(3)	Do.
		Ex. Z-107(4)	Do.
			} Collectively.
	Advocate Mr. J. M. Thakore.	Ex. Z-108	Copy of statistics of food poisoning cases in Kerala State.
	Do.	Ex. Z-109	Copy of Notifications Circulars issued by Govt. of Kerala regarding food poisoning cases.
	Do.	Ex. Z-110	Statement showing the amount of stocks seized or sealed under each item and value.
<i>Bombay</i>			
18	Capt. A. A. Jaffer	Ex. Z-111	Log Book of Ship S. S. Jai Hind.
	Do.	Ex. Z-111(1)	Rough Log Book do.
144	T. G. Punwani Bright Bros.	Ex. Z-112	Statement showing chemical resistance of Alkatheme.
	Advocate Mr. J. M. Thakore.	Ex. Z-113	Tally sheets of hatches Nos. 2, 3 and 4.
		Ex. Z-114	
		Ex. Z-115	
	Do.	Ex. Z-116	Bill of lading No. 78 of 25-3-58 and Invoice No. 19783, dt. 24-3-58 of Chhaganlal Khimj.
9	Mr. Vasavada	Ex. Z-117	List of some non-explosives and non-inflammable commodities, on which double rates are charged.

LIST OF DOCUMENTS PRODUCED BY OTHER PARTIES

Sr. No.	Name of the witness	Exhibits No.	Particulars
2	Mr. Subbarao	1	Advertisement of Bright Bros. Letter dt. 23-7-1957.
	Do.	2	Bill of lading 824/24-2-55 of Scindia Steam Navigation Co. Charge at Rs. 36 or 40 C.ft. ton.
	Do.	3	Copy of letter from Chika dated 17-11-1955 to Dabke (insecticide).
	Do.	4	One Port Trust Chhapa. S. S. Sabarmati Shipping Bill No. 04676, dt. 29-11-1955.
	Do.	5	Letter from Chika to Dabke dt. 6-1-56.
	Do.	6	Port Trust Chhapa (01806/13-1-56.)
	Do.	7	Portion of Ex. X-1 "Harmless Chemical" on Ex. 'X'.
	Do.	8	Originals of 4 letters from Plant Prop. Dept. of Chika Ltd. to M/s. Dabke.
	Do.	9	Photographs of damaged cases.
	Do.	10	Shipping Bill No. 1806, dt. 10-1-1956 signed by Chika (Mr. Vaidyanathan) Chemicals Folidol E-605.
	Do.	11	Photostat copy of Insurance Policy of Baloise Marine Insurance Co.
3	D. N. Nakate	11-A	Original Insurance Copy with cash memo. of Baloise Marine.
	Do.	12	Pamphlet regarding Folidol.
	Do.	13	Shipping Bills : (i) No. 1650/17-1-57 S. S. Sagar Veena. (ii) No. 1660/17-1-57 S. S. Sagar Veena. (iii) No. 2780028-9-57 as Victoria Marie. (iv) No. 1991/24-2-58 as Sabarmati.
	Do.	14	Port Trust Chalan (4) Collectively.
	Do.	15	Copies of Bills of Lading 7 Colly.

Sr. No.	Name of the witness	Exhibits No.	Particulars
3	D. N. Nakate . . .	16	Statement of charges (7) (Colly.)
4	V. V. Babke . . .	17	Letter from Chika Ltd. (Ex- 'X' which was originally marked) to Dabke dt. 30-5-56 Changing 'Insecticide' to 'Harmless Chemicals'.
	Do. . . .	18	Five letters of instructions from Chika Ltd. to Dabke (Collectively).
	Do. . . .	19	Copy of letter from Chika to Dabke dt. 19-2-55 originally marked Ex. X (1).
	Do. . . .	20	Airway Bill 6th January, 1958 (Packed according to directive of Air Cargo).
	Do. . . .	20 (1)	Airway Bill 4438237. Copy dt. 21-1-1958.
	Do. . . .	21	Bill of Entry for consumption dt. 16-1-1958.
	Do. . . .	22	Invoice 3/1, dt. 4-1-1958.
	Do. . . .	23	One pamphlet of Folidol with initials of Dabke's clerk.
9	K. R. Vasavda . . .	24	Red Book of Tariff Rates. Page 8, item II of Book I.
	Do. . . .	25	Pages 70, 72 and 88 of Tariff Schedule marked.
	Do. . . .	25 (1)	Page 91 of Tariff 'Schedule' marked.
<i>Bombay</i>			
144	Mr. Punwani . . .	26	Advertisement issued by Bright Bros.
145	Mr. Gidwani . . .	27	Copy of letter of Bright Bros. No. 1268/25-9-57 to Chika.
	Do. . . .	28	Copy of letter of Bright Bros. dt. 7-3-1958 to Chika.
	Do. . . .	29	Copy of letter from Chika dt. 14-3-1958 in reply to Ex. 28.
149	Dr. Nanji . . .	30	Report dt. 26-6-58 from Dr. Nanji regarding effect of Folidol on Polyethelene.
	Do. . . .	31	One carboy and cap (broken pieces).

Sr. No.	Name of the witness	Exhibits No.	Particulars
149	Dr. Nanji . . .	32	I. C. I. Publication I. S. 380.
	Do. . . .	33	Report dt. 26-6-58 from Dr. Nanji on properties of Folidol.
	Advocate Mr. D'Silva .	34	Copy of letter dt. 23-9-57 from Chika to M/s. Bright Bros. regarding carboys.
2	Mr. Subba Rao .	35	Small container of Folidol.
	Do. . . .	36	Particulars of cargo received on S. S. Jai Hind-Booking Notes.
148	Mr. Bhansali . . .	37	Good forwarding notes in respect of Arsenic and formal Dehyde (Colly.)
150	Mr. Bernhardt . . .	38	File containing correspondence regarding Aluminium containers.
	Do. . . .	39	Four files containing correspondence regarding containers.
	Do. . . .	40	Letter to M/s. Bright Bros. dt. 18-7-57 from Chika.
	Do. . . .	41	Letter from Bright Bros. dt. 20-8-57 to Chika.
	Do. . . .	42	Copy of observations on the oral and cutaneous Toxicity of a Group of Insecticides by Head Divn. of Pharmacology.
	Do. . . .	43	Letter dt. 7-9-57 from Chika to Bright Bros.
	Do. . . .	44	Correspondence with Bayers regarding Alkathene containers.
149	Dr. Nanjee . . .	45	I. S. Note 447 by Imperial Chemical Industries regarding Alkathene.
	Messrs. Mulla & Mulla (Mr. Petigara).	46	Copies of extracts from the Minutes of the General Rates Committee.

LIST OF DOCUMENTS MARKED FOR IDENTIFICATION
KERALA FOOD POISONING CASES COMMISSION

Sr. No.	Name of the witness	Exhibit	Particulars
2	Mr. Subbarao . . .	X (marked as Ex. 17)	Letter from Chika Ltd. to Dabke dt. 30-5-58 changing 'Insecticides' to "Harmless Chemicals".
	Do.	X-1 (marked as Ex. 19)	Copy of letter from Chika to Dabke dt. 19-2-1955 'insecticide'.
	Do.	Y	Copies of 5 letters.
	Do.	Y-1	Bills with letters (Photostat copies) Letter from Chika Ltd. to M/s. Dabke with bills. (Photostat copies).
17	P. P. Shandyl . . .	X-2	Photostat copy of Boat Note.

APPENDIX III

LIST OF DEAD PERSONS

I. *Munambam Police Station.*—

1. C. R. 26/1958	1. Damodaran	60 Years.	
2. C. R. 27/1958	} 2. V. V. Joseph	9 years.	
”		3. Thankapan	18 years.
”		4. Madhavan	16 years.
”		5. Anandan	11 years.
”		6. Shankaran Sukumaram	15 years.
”		7. Sadashivan	19 years.
C. R. 29/1958	} 8. Sashi	6 years.	
		9. Vishwan.	4 years.
C. R. 29/1958 (not proved).	10. Pillai Pillai.		

II. *Tripoonithura.*—

C. R. 24/1958	11. Hari Krishna Menon	3 years.
C. R. 25/1958	12. Govindan	7 years.

III. *Parur.*—

C. R. 30/1958	13. Radha	2 years.
Do.	14. Unnamed child	6 months.

IV. *Ankamali.*—

C. R. 46/1958	15. Babu	2 years.
(No evidence except of 2 Doctors G.W. 58 & 59)	16. Rosy	2 months.
C. R. 48/1958	17. Infant	7 months.

V. *Trichur Tam.*—

C. R. 78/1958	18. Bharathi	43 years.
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VI. *Kunakulam C. S.*—

C. R. 42/1958	19. 3 months' old child.	
Do.	20. Lakshmi/ w/o Chakapan	43 years.
Do.	21. Karthagiri	12 years.
Do.	22. Bhargan	9 years.
Do.	23. Subramaniam	3 years.
Do.	24. Parmeshwaran Nambudri.	16 years.

VII. *Mattancherry P. S.*—

C. R. 57/1958	25. Rosi	30 years.
Do.	26. Anyama	5 years.

VIII. *Cochin Kasba.*—

C. R. 25/1958	27. Prakasam	4 years.
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IX. *Trivandrum District.*—

C. R. 39/1958	28. Michael Fernandez	13 years.
Do.	29. Stalin Fernandez	2½ yers.
Do.	30. Arifa Bibi	8 years.
Do.	31. Soman	4 years.
Do.	32. Mohammed Rafi	4 years.

X. *Soornad Police Stn., Sasthankota.*—

C. R. 20/1955	33. Raju	5 years.
	34. Gopalan	14 years.
	35. Krishnan Kutty	11 years.
	36. Bosque	12 years.
	37. Pius	12 years.
	38. Sadanandan	7 years.
	39. Raghavan	14 years.
	40. Bhaskaran	10 years.
	41. Cyrilamma	12 years.
	42. Edison	4 years.
	43. Antony	10 years.
	44. Marykutty	5 years.
	45. Sreedhara Panicker	19 years.
	46. Abdulsalam	6 years.
	47. Jerone	4 years.
	48. Lekshmanar	11 years.
	49. Rajappan	7 years.
	50. Chellappan	14 years.
	51. Krishnan Kutty	11 years.
	52. Perumal	21 years.
	53. Jem Raja Manikkom	40 years.
	54. Narayana Pillay	..
	55. K. N. Ramachandran Pillay	22 years.

X. Soornad Police Stn., Sasthankota—contd.

56. M. Abraham	18 years.
57. P. Anirudhan	21 years.
58. N. Sivaraman Nair	18 years.
59. C. T. Abraham	18 years.
60. N. Thankappan Nair	23 years.
61. A. M. Gopalakrishnan	18 years.
62. P. Eappachan	27 years.
63. P. K. Oommen Tharakan	21 years.
64. Mammen P. Mathew	18 years.
65. D. John Kutty	24 years.
66. T. S. Thomas	19 years.
67. N. Sreedharan Pillay	21 years.
68. Ramchandran Pillay	22 years.
69. V. Sankara Pillay	19 years.
70. M. J. Koshy	19 years.
71. K. Janardhanan Unnithan	19 years.
72. V. Pachu Pillay	22 years.
73. V. Gopalakrishna Pillay	21 years.
74. K. T. Chellappen	19 years.
75. Sukumara Pillay	24 years.
76. P. S. Samuel	20 years.
77. Y. Daniel	19 years.
78. K. Bhaskaran	19 years.
79. P. Damodaran Pillay	25 years.
80. K. John Mathew	18 years.
81. Gopinadhan Nair	21 years.
82. Cherian Joseph	19 years.
83. N. Sekharan Nair	22 years.
84. V. Sreekrishnadas	21 years.
85. A. Thomas Rajan	18 years.
86. V. Vikraman Nair	18 years.
87. O. R. Gopalakrishna Pillay	19 years.
88. A. Balachandran Nair	18 years.
89. Radheyam Nair	19 years.
90. P. John	19 years.

X. Soornad Police Stn., Sasthankota—concl'd.

91. V. Purushothaman	.	.	21 years.
92. K. Narayanan Nair	.	.	21 years.
93. V. Indrasenan	.	.	19 years.
94. C. T. George	.	.	19 years.
95. S. Appu Achari	.	.	..
96. Sudalaimuthu	.	.	..
97. V. Kutty	.	.	20 years.

Fort Police Station.—

C. R. 118/1958	.	98. Badesha	.	.	26 years.
Do.	.	99. Abdul Asraf	.	.	6 years.
Do.	.	100. Ramdas	.	.	24 years.
Do.	.	101. Shahul Hamid	.	.	18 years.
Do.	.	102. Appekatan	.	.	6 years.
Do.	.	103. Challapan	.	.	14 years.
Do.	.	104. Rajgopalan	.	.	14 years.
Do.	.	105. Gopakumar	.	.	3½ years.
Do.	.	106. Vishwanathan	.	.	6 years.
Do.	.	107. Harikrishna	.	.	2½ years.
C. R. 106/1958	.	108. Sanmukham Chetiar	.	.	23 years.

APPENDIX IV

FOOD POISONING INQUIRY COMMISSION

SITTINGS AND INSPECTION AT BOMBAY, ERNAKULAM AND TRIVANDRUM.

At Bombay.

6th, 7th, 9th and 10th June, 1958.

At Ernakulam.

12th (A. N.), 13th, 14th, 15th, 16th and 17th June, 1958.

Inspection by the Commission of the Godown of Messrs. A. V. Thomas and Company, Shipping Agents, Willingdon Island and Godowns of New Dholera Steamship Company and its Sister Concerns, Mattancherry, on the 15th June, 1958.

At Trivandrum

18th, 19th and 20th June, 1958.

Inspection by the Commission of the site of Lok Sahayak Camp at Sasthankotah, *en route* to Trivandrum on the 17th June, 1958.

At Bombay

25th, 26th, 27th, 28th, 29th and 30th June, 1958.

Inspection by the Commission of the Progressive Chemicals, Cadell Road, Bombay, on the 24th June, 1958, at 3 p.m.

APPENDIX V

Statement received on 4th July 1958 from Dr. A. R. Natarajan, Chemical Analyser to Government of Madras, Madras

Sr. No.	Date of receipt	From whom received	History of the case and signs & symptoms prior to death if any	Salient features of post-mortem examination	Results	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	26-6-1955	Medical Officer, Local Fund HI. Yercaud, Salem Dt.	The deceased's wife had kept "Eketox" (used for spraying coffee plants to kill green bugs and other insects that attack coffee plants) in a piece of paper on a window sill. This powder has blown off by wind and fell on the plate where food was already kept served for the deceased. No one noticed this. The deceased took his food at about 7 P.M. started vomiting and was rolling in pain and agony and died at about 9 P.M. The dog and fowls which ate the vomit also died. The viscera of the deceased and the remnants of powder on the paper were sent to us for examination.	Nil	We detected eketox (parathion) in the stomach and contents and in the vomit. The powder was found to be eketox.	Death by accidental poison.
2	31-8-1956	Medical Officer, Gobichettipalayam, Coimbatore Dt.	A woman aged about 40 years was alleged to have committed suicide by taking a poison used as an insecticide for tobacco pests. Viscera of the deceased and a tin containing the remnants of poison were sent to us for analyses.	Congestion of all the internal organs. Especially lungs were oedematous exude reddish bloody fluid on pressure.	We detected parathion in the stomach and contents in the intestine & in the liver & kidney. The tin contained parathion.	Suicidal.

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| 3 | 25-3-57 | Medical Officer,
L.F. Dispensary,
Arantangi, Tanjore
Dt. | A male aged about 29 years was alleged to have taken a poison used to destroy the pests over the chilli crops on one evening since he was suffering from stomach pain for the past five years & he died on the same night. The viscera of the decd. were sent for analysis. | Heart—all Chambers empty decomposing Bogh the lungs congested. On section & pressure exude redish bloody fluid, no adhesions. Liver soft, greyish black decomposing. Stomach congested, & dilated contained un-digested rice, green chillies dhall etc. | We detected parathion in the stomach and contents only. | Suicidal. |
| 4 | 20-5-57 | Medical Officer, L.
F. Hospital, Hosur,
Salem Dt. | As per the police, the history was that a Muslim lady aged about 24 years was alleged to have consumed poisonous powder used for spraying on cabbage crops to protect from insects & this committed suicide. Viscera were sent to us for analysis. | Lungs—softened & disintegrating—highly congested. Stomach distended with gas & food matter injected on both surface. | Parathion was detected in the stomach and contents only. | Do. |
| 5 | 1-7-57 | Medical Officer,
Govt. Hqrs. Hl.,
Coimbatore & Tk.
Sub Magistrate,
Coimbatore. | A man, a mill worker aged about 20 years was found dead in his room. It was observed that the deceased had blood in mouth and nose. A glass tumbler with some green contents was found near the deceased. This tumbler and the scraped earth suspected to contain the vomit of the decd. were sent by the S.M. & the Visceral matters were sent by M.O. to this office for examination. | Nothing particular. | Parathion and copper were detected in the stomach and contents, parathion alone in the intestine & contents & copper alone in the liver. No poison was detected in any of the other items. | Do. |

(1)	(2)	(3)	(4)	(5)	(6)	(7)
6	28-9-57	Police Surgeon Madras Medical College, Madras.	According to the Police a man aged about 25 years was applying Pesticides (Folidol-diluted solution) along with two others to the paddy fields in a suburb of the city. After some time he had vomiting and felt giddy and finally died before he was brought to the casualty of the General Hl. Madras. It was suspected he would have inhaled poisonous substance. The viscera were sent to us for analyses.	Heart—Hypertrophy of the left ventricle and chambers contained fluid blood. Lungs—dilated, congested. Oedematous. Stomach marked congestion and contained 50 grams of brownish fluid. Brain Oedematous.	Detected copper in the liver & kidney, stomach, & contents & intestine and contents. Parathion was not detected.	Death by accidental poison.
7	1-3-58	Medical Officer, Gobichettipalayam, Coimbatore Dt.	A boy aged about 11 years was alleged to have eaten cotton plant fruits, where some insecticide had been sprayed. He died immediately after consumption. Viscera were sent to us for analyses.	Whitish material were found (probably the cotton fruit remnants) in the upper alimentary and respiratory tracts. Stomach, intestine— injected very much.	Detected parathion in the stomach and contents only.	Death by accidental poison.
8	1-3-58	Medical Officer, L.F. Hospital, Sa- tyamangalam, Coimbatore Dt.	One female aged about 15 years was alleged to have committed suicide by taking 'Folidol' E-605, Bayer, which is used as an insecticide for cotton & tobacco plants etc. The viscera & the remnant of the poison contained in an aluminium container were sent to us for analyses.	Nil:	Found the remnants of the poison to be parathion. (Folidol) Parathion (Folidol) was detected in the stomach contents & in the intestine and contents.	Suicidal.
9	3-3-58	Woman Medical Officer, Govt. Hos- pital, Mettupalayam,	One woman aged about 30 years & her female child 6 months old died in a village near Coim-	Lungs—highly congested Heart—Normal both chambers empty.	Parathion was detected in the container which contained the alleged	Suicidal.

	Coimbatore Dt. and Sub-Magistrate, Mettupalayam, Coimbatore. Dt.	batore Town. It was believed that the woman who consumed Folidol and the child which was suckled with her breast after consuming poison both died. Visceral matters of both & the container suspected to contain Folidol were sent for analyses.	Child—nothing particular.	poison, in the stomach and contents and in the liver of the mother. No parathion was detected in the viscera of the child.		
10	18-3-58	Medical Officer, Government Hospital, Krishnagiri, Salem Dt. and Sub-Magistrate, Krishnagiri.	One male aged about 30 years was found dead in his house. An empty polyethelene container with printed matter "Folidol E-605" was found by the side of the body. Parathion poisoning was suspected and the viscera and the container were sent to us for examination.	Nothing particular.	Parathion as detected in the washings of the container and in the stomach and contents of the deceased.	Suicidal.
11	2-3-58	Medical Officer, Primary Health Centre, Avanashi, Coimbatore Dt. and Sub-Magistrate (J), Mettupalayam.	A lady aged about 25 years and her 6 year old boy and 3 year old girl died. It was believed that the deceased lady consumed Folidol mixing in the coffee and also given the same coffee to her children in order to kill them. The viscera of all the three, the Folidol container, the two tumblers used for drinking were sent here for analyses.	Blood oozing from the nostrils. Face pale and oedematous. Heart and lungs looked congested. Brain also congested and oedematous.	Detected parathion (Folidol) in the washings of the container and two tumblers, in the stomach and contents in the intestine and contents and in the liver of the adult, in the stomach and contents and in the intestine and contents of the boy and in the stomach and contents of the girl.	Suicidal and Homicidal.
12	2-5-58	Medical Officer, Government Hospital Rajapalayam, Ramnathapuram Dt.	A male aged about 55 years suspected to have taken a powerful liquit insecticide. No history of signs and symptoms of poisoning were available.	Stomach congested marked and contained brownish strongly pungent liquid.	Detected parathion (Folidol) in each of the visceral matters sent here for analysis.	

(1) (2) (3) (4) (5) (6) (7)

- 13 3-5-58 & 5-5-58 1. Suptd. Government Hqrs. Hospital, Chingleput
2. Sub Magistrate, Chingleput.
- On 30-4-58 night there was marriage in a village near Chingleput. Cooked rice and brinjals cooked with bengal grams etc. were served. On the same night about 30 persons who had taken the food had vomiting and purging, felt giddy. They were admitted in the Government Hqrs. Hospital Chingleput. One of them died in the Hospital.
- The viscera of the deceased, the samples of the Dhall and the remaining of the cooked food were sent here for examination.
- Stomach MM deeply congested—Brain oedematous.
- No poison was detected. Folidol was specially looked for but was not detected in any of them.
- 14 22-5-58] Medical Officer, Kotagiri, Nilgiris and Addl. First Class Magistrate, Coonoor.
- One woman aged 20 years ate Vadai and took coffee. On the same day after about 3 hours she began vomiting blood. The stomach wash and eight packets of edibles of bun, sugar, pokada etc. were sent for analyses.
- Folidol was not detected.
- 15 26-5-58] Medical Officer, Government Hospital, Tiruvannamalai.
- A family consisting of five said to have been admitted in the Government Hospital, Tiruvannamalai alleged to have been cases under food poisoning. They were alleged to have taken wheat, cake, sugar and fried dry
- Nil.
- No posison was detected. Folidol was specially looked for but was not detected.

fish a little while later they all started vomiting. One of the members a girl, age not given, died. The viscera of the girl alone were sent.

16	26-5-58	Dean, General Hospital, Madras.	A male aged 21 years was alleged to have taken Puri Potato in Kelly's Cafe vomited 12 minutes after eating. Vomited 8 times—general condition was good on admission. Stomach was sent for analysis.	Nil.	Folidol was not detected.	..
17	31-5-58	Medical Officer Local Fund Dispensary, Tiru-thiyur, Chingleput Dt.	A male aged 50 years was alleged to have died of food poisoning by taking tea from a local shop. Viscera were sent to us for examination.	Nil.	No parathion (Folidol) was detected.	..
18	5-6-58	Medical Officer, Government Hospital, Periakulam, Madurai Dt.	A male aged about 23 years was alleged to have been spraying folidol for a local field—after that he took his meals when he felt giddy and was brought to the Hospital and died on the next day morning. Viscera were sent to us for examination.	Universal congestion of all the internal organs.	No parathion (Folidol) was detected.	..
19	5-6-58	Do.	A male aged about 45 years was brought to the Hospital with the history of poison inhalation (Folidol) while he was spraying the medicine in the field. He was unconscious while admission. Vomit and viscera were sent for analyses.	Nil.	Do.	..

(1)	(2)	(3)	(4)	(5)	(6)	(7)
20	10-6-58	Public Analyst, Corporation of Madras.	A bad quality of wheat atta supplied by one of the mills was suspected to have been contaminated with Folidol E-605. A sample of the Atta was sent to us for the detection of Folidol.	Nil.	No Folidol (E-605) was detected in the atta.	Free from contamination with Folidol.
21	10-6-58	Dean, Government General Hospital Madras.	A male aged about 40 years, was admitted with the history of alleged food-poisoning—General condition was good on admission—Stomach wash was sent for analysis.	Nil.	No Parathion was detected.	..
22	10-6-58	Dean, Government General Hospital, Madras.	A boy aged 4 years was admitted with the history of alleged food poisoning—Stomach wash sent for analysis.	Nil.	No parathion was detected.	..
23	12-6-58	Dean, Government General Hospital, Madras.	A man aged 50 years was brought to the Hospital with the history of having taken coffee at 8 P. M. on the previous day following which he had diarrhoea and vomiting Stomach wash was sent for analysis.	Nil.	No parathion was detected.	..
24	13-6-58	Superintendent,—Erskine Hospital, Madurai.	13 persons were alleged to have taken some sweets. All developed vomiting—Two of them had vomiting and diarrhoea with griping pain the abdomen.	Nil.	No parathion was detected.	..

25 16-6-58	Dean, Government General Hospital, Madras.	Sweet and stomach wash of one person were sent here for analyses. Three persons one female aged 36 years, second a male child about 4½ years and third a male child 2½ years ate tamarind rice and all had vomiting and diarrhoea. Stomach washes of the victims were sent to us for analysis.	Nil.	No parathion was detected.
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Parathion (Folidol E. 605) was detected in eleven of the twenty-five cases.

Sd./ A. R. NATARAJAN, 3-7-1958.
Chemical Examiner to Government, Madras-3.

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