

failure. A certain degree of renal failure was a marked characteristic of most of the cases.

(ii) Cardiac dilatation, though marked in a few instances, was not a characteristic feature of the outbreak.

(iii) Atony of the intestine was present in only a few instances. Attention to this symptom was drawn in the Calcutta outbreak of 1926, and perhaps its absence in the Birbhum epidemic accounts for the lessened mortality as compared with the Calcutta figures.

(iv) In most patients the knee-jerks were lost or modified.

(v) In all the "squeezing test," applied to the calves, was positive.

(vi) All the patients appeared to have derived the infection from other sources than rice—probably from mustard oil.

(vii) Very few showed pigmentation of the face,—the sign of hypo-adrenia.

Treatment.

The treatment adopted was mostly dietetic. Victims of the disease, and also persons residing in the affected area, were instructed to take the following foods; germinating gram; oranges; lemons; tomatoes; raw onion leaves; cabbage leaves; unboiled milk; eggs—quarter boiled; molasses; yeast, from the date palm (palmyra tree); bread; *khichuri*, i.e., a mixture of rice and whole grain *mung* or *mossurie* boiled together; beans.

Medicinal treatment.

The following were used:—

(i) Beemax; one teaspoonful b.d. or t.d.s.; or Marmite in gr. 20 doses t.d.s.

(ii) Yeast-vival; half a teaspoonful in hot water, was prescribed to some.

(iii) Metatone (P. D. & Co.). Two teaspoonfuls t.d.s. to neurotic and rich patients, and as an after- tonic to some others.

(iv) As a general cardiac and diuretic tonic, the following general prescription was administered (with or without modifications) to all patients.

| | | | |
|---------------------------------|----|---------------|--|
| R | | | |
| Colossal calcium (Crooks' oral) | .. | 1 dr. | |
| Extract punarnava liquidum | .. | 1 dr. | |
| Extract arjun liquidum | .. | 1 dr. | |
| Tinct. digitalis (P. D. & Co.) | .. | m, 10 | |
| Liquor ammoniæ acetatis | | | |
| Liquor ammoniæ citratis | aa | 1 dr. | |
| Syrupi | | | |
| Aquam | .. | aa oz. 1 | |
| | | oz. i. t.d.s. | |

(v) Liquor adrenalin hydrochloridi, 1:1,000; in 3-minim doses b.d. was given to some patients.

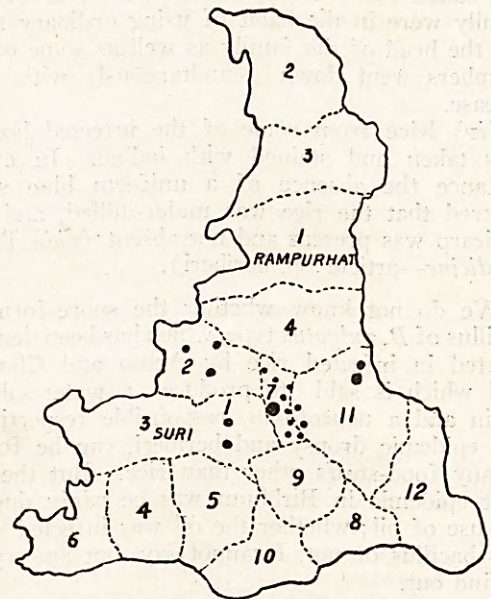
(vi) Syrup hæmogen with vitamine extract or liver extract (B. I. Co.) was prescribed in some cases to combat anæmia and asthenia.

The attached table gives details of 28 cases studied.

EPIDEMIC DROPSY IN BIRBHUM.

By U. GHOSH, M.B. (Cal.), D.P.H., D.T.M. (Bengal),
District Health Officer, Birbhum.

History.—During the middle of November, 1928, I was called in to the house of a local medical practitioner and friend of mine residing in Suri in this district, to see some members of his family suffering from œdema of the feet. I found that 8 out of the 11 members of the household were affected, including a compounder who used to take his breakfast and afternoon tea at this particular house. The rice used by the family was the parboiled and home-husked variety. The mustard oil used came from a local shop, the owner of which used to buy it at Sainthia, a junction station on the E. I. R. loop, 11 miles from Suri. At this station there is only one oil mill, and it is owned by a Marwari gentleman. On the occurrence of subsequent cases in other families in Suri, enquiries were made, and it was found that the mustard oil which they used all came from the same shop in Suri. Later, it was found that some 30 cases had occurred in Sainthia, confined to some 8 or



Black spots indicate the position of villages affected with epidemic dropsy in November and December, 1928.

Rampurhat Subdivision: Suri (Sadar) Subdivision:

- | | |
|---------------------|---------------------|
| 1. Rampurhat Thana. | 1. Suri Thana. |
| 2. Murarai Thana. | 2. Md. Bazar Thana. |
| 3. Nalhati Thana. | 3. Rajnagar. |
| 4. Moureswar Thana. | 4 & 5. Dubrajpur. |
| | 6. Khoirasole. |
| | 7 & 9. Sainthia. |
| | 8. Bolpur. |
| | 10. Illambazar. |
| | 11. Labpur. |
| | 12. Nanur. |

9 families; this was followed by reports of outbreaks in some 8 or 9 villages around Sainthia. The distribution of the disease is shown in the attached map.

TABLE.
List of infected persons.

| Name. | Age. | Sex and nationality. | CLINICAL FEATURES. | | | | | | | Source of rice, oil, etc. | Number of infections in the house. | REMARKS AND RESULT. |
|-------|------|----------------------|--|--|--|-----------------|--|-----------------------------|--|--|--|---------------------|
| | | | Œdema. | Condition of Heart. | Urine. | Blood-pressure. | Bowels. | Reflexes. | Fever and other symptoms. | | | |
| A. | 29 | H.M. | Œdema of legs which diminishes in the morning. | Pulse 92. Position apex in the 6th space in the mammary line. 1st sound muffled and equal spacing of both sounds. | Amount small. | 110 | Regular. | Knee jerks diminished. | Nil, but pain in calves and restlessness at night. | Rice—"home" but not stored from before-hand. Oil from Sainthia. | Nil. | Cured. |
| B. | 45 | H.M. | Œdema of legs. | Nothing abnormal | No trouble. | 130 | There was intense diarrhoea and occasional vomiting before the onset of œdema. | No abnormality. | Nil. | Rice—Sun-dried (Attap) Oil—from a grog-shop which imported oil from Sainthia, the grog-shop-keeper himself being infected. | 6 (5 others took a kind of rice different from his). | Not yet cured. |
| C. | 25 | H.M. | " | Equal spacing of two heart sounds. | " | " | " | " | Nil. | " | Servant of B. | " |
| D. | 30 | H.M. | " | " | " | " | (1) There was diarrhoea after the œdema subsided. | " | Pain in shoulder and back after œdema, and diarrhoea have subsided. | " | Compounder of B. (B, being medical practitioner) | Cured. |
| E. | 13 | H.M. | " | " | " | " | " | Knee jerks diminished. | Nil. | " | Son of B. | " |
| F. | 10 | H.F. (child) | " | " | " | " | " | No abnormality. | Nil. | " | Daughter of B. | " |
| G. | 17 | H.M. | " | " | " | " | " | " | Nil. | " | Son of B. | " |
| H. | 36 | H.F. | Swelling of legs and face. | (1) Cough, (2) Heart dilated systolic murmur. Pulse 102. Respiration 42. | Scanty urine. | 100 | (1) Constipation. (2) Tympanites. | Knee jerks diminished. | Nil. | Rice—from his own house. Oil—from the shop which supplied B. | " 2 " | " |
| I. | 48 | M.M. | Swelling of legs. | " | " | " | " | " | Nil. | " | Husband of H. | " |
| J. | 40 | H.M. | Œdema of legs for 1½ months. | No change. | Scanty urine. | " | Diarrhoea. | " | Nil. | Rice—from home. Oil—from Sainthia. | The infected person is the grog shop-keeper who supplies oil to everybody from B to I. | Not yet cured. |
| K. | 38 | M.M. | Œdema of legs for a fortnight. | " | " | " | " | " | Nil. | Rice—from J's house. Oil—from J's shop. | Nil. | Cured. |
| L. | 30 | H.F. | Œdema of legs, for a week only. | " | " | " | Diarrhoea. | Reflexes knee jerks absent. | Fever ++ Pain in calves. | Rice—"home". Oil—from J's shop. | Nil. | " |
| M. | 30 | H.M. | Œdema of legs which lasted for 8 days. | " | " | " | " | Nil. | " | " | 2 | " |
| N. | 38 | H.F. | " | " | " | " | " | " | " | " | Sister to M. | " |
| O. | 40 | H.M. | Œdema of both legs. | " | " | 130 | " | Reflexes normal. | " | " | " | " |
| P. | 34 | M.M. | Œdema of legs and scrotum. | Heart dilated (1) Apex in mammary line in the 5th space. (2) Equal spacing of two heart sounds. | Scanty urine and it contains no albumen. | 120 | " | Knee jerks absent. | (1) Giddiness. (2) Pigmentation of face. (3) Watering of eyes. | Rice—home. Oil—from Sainthia. | " | Not yet cured. |
| Q. | 14 | H.F. | (1) Œdema of both legs. (2) Œdema of face. | Pulse 100. (1) Irregularity of pulse. (2) Equal spacing of two heart sounds. | Scanty. | 145 m.m. | Constipation was marked. | Reflexes exaggerated. | " | " | Nil. | Cured. |
| R. | 33 | M.M. | Œdema of legs. | Equal spacing of two heart sounds. | No change | " | " | No change. | " | " | Servant of P. | " |
| S. | 30 | M.M. | (1) Œdema of legs. | Pulse 92. No other change. | " | " | Diarrhoea. | Reflexes knee jerks absent. | " | " | " | " |
| T. | 40 | M.F. | Œdema of legs. | Heart dilated. Pulse 92. | " | 130 m.m. | " | " | " | Oil—from Sainthia. | 2 | " |
| U. | 50 | M.M. | " | " | " | 140 m.m. | " | Knee jerks absent. | " | " | Wife of U. Husband of T. | " |
| V. | 32 | H.M. | " | " | " | " | " | " | " | " | 2 | " |
| W. | 20 | H.F. | " | " | " | " | " | " | " | " | Wife of V. | " |
| X. | 32 | H.M. | " | " | " | " | " | Knee jerks ++. | (1) Fever every afternoon. (2) Pain in epigastrium. | " | " | " |
| Y. | 12 | H.M. | " | Apex ½ inch outside the nipple line. | " | " | Constipation. | Knee jerks absent. | (1) Fever in the evening. (2) Headache. Spleen ++. Pigmentation of face. | " | " | Not yet cured. |
| Z. | 42 | H.M. | " | (1) Palpitation. | Scanty. | " | Diarrhoea. | " | " | " | " | " |
| 1. | 22 | H.M. | No œdema. | (1) Shortness of breath on exertion. (2) Palpitation. (3) Cough. (4) Dilatation of heart. (5) Equal spacing of two sounds. | " | 110 | Constipation. | " | " | " | " | " |
| 2. | 28 | M.M. | " | " | " | " | Dysentery before-hand. | Knee jerks absent. | (1) Pain in both the legs. (2) Paresis of 2 legs. (3) Inability to walk. | " | " | " |

Causes.—(i) Diseased Rice.—Was this outbreak due to the consumption of diseased rice, which Acton and Chopra believe to be the cause of epidemic dropsy? In no case that occurred was milled rice used; on the contrary, in two families which were affected the home-husked variety without parboiling (*atap*) was used. The variety of rice used was in no instance more than one year in storage, and had been stored in the specially prepared and covered godown in the open space of the compound near the house.

(ii) Vitamin Deficiency.—In all cases enquired into, although it was found that there was a lack of intake of fruits or fresh vegetables (raw) in the diet, or a deficient intake of milk, yet this could not account for the epidemic, since other persons on the same diet did not contract the disease. Further, the deficiency in intake of fresh vegetables and milk is permanent among the individuals concerned, yet they did not develop epidemic dropsy previously. The theory that the persons affected were on the border line of vitamin deficiency, and that some other external or internal cause or causes precipitated the outbreak, does not seem to be tenable.

(iii) Mustard oil.—In one family at Bhagatipur it was reported that they had mixed raw mustard oil thoroughly with 3 seers of fresh goat flesh; had kept it aside for two hours, and then cooked and eaten it. Ten members of the family partook of this meal, including menials; during the night they were affected by purging and vomiting; some later developed œdema of the legs; cardiac distress ensued in one patient; and extreme weakness in others within four or five days. On making enquiries at Sainthia railway station, I learnt that the owner of the oil-mill some four months previously or so had imported 4 or 5 wagon loads of a particular seed resembling *pakra* seeds through a foreign railway. There is also another variety of seed grown locally which resembles mustard seed; it is known by the local name of *kaur* thorn seed, and yields oil on pressure. It grows wild in the jungles and does not require any special attention in cultivation. I have heard from a local man that these seeds are sometimes mixed with mustard seeds, and possibly they may be responsible for the epidemic.

Conclusion.—The consensus of opinion amongst local medical practitioners is that it was a particular batch or consignment of mustard oil which was the cause of this outbreak, and that subsequent consignments were not adulterated. That the outbreak was not due solely to deficiency of vitamin B is shown by the explosive character of the outbreak; the deficiency in vitamin B is applicable to almost all persons living in the locality, and the results of it would only have developed slowly. The rice infection theory is also not tenable, because in every instance the rice used came from the family store, and not from a common source.

TABLE.

| | Ingredients used for extraction of "Mustard" oil, and their prices. | | |
|----------------------|---|----------------------------|--|
| | Black variety, per maund. | Yellow variety, per maund. | |
| 1. Mustard | .. 7-8 to 8-8 | 9-0 to 9-8 | Cakes 3-6 without bag. |
| 2. Soorgoocha | .. 7-4 to 7-8 | | Used when c h e a p; otherwise Sorgooj. |
| 3. Posta | .. 13-0 to 15-0 | | |
| 4. Ground nut | .. 6-8 to 7-0 | | Used when c h e a p; otherwise Sorgoocha cakes are good. |
| 5. Til | .. 8-0 to 8-8 | | |
| 6. Linseed. | Not known. | | |
| 7. Pakra. | Not known. | | |
| 8. Kaur thorn seeds. | Not known. | | |

INDIAN DIETARIES IN THE UNITED PROVINCES.

By NIAANT DHAN BANERJI,

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THE object which this enquiry dealt with were to ascertain, as far as possible, with regard to the dietaries actually in use in the United Provinces—

(i) their average nutritive values.

(ii) whether full monetary value is obtained for the money spent on the different articles of diet.

(iii) whether the diets concerned are suitable for the particular classes of persons who consume them; and, if not,

(iv) what should be the approximate changes in each class.

[*Note.*—As Dr. C. S. Thakur, F.C.P.S., L.M.S., Professor of Physiology, King George's Medical College, Lucknow, is of opinion that the average Indian diet is not lacking in vitamins, the vitamin aspect is not raised in this paper (1).]

The actual diets to be considered are as follows:—

(A) Average Vegetarian Diet.

Morning.

Sugar $\frac{1}{2}$ chatak.

Milk 1 chatak.

Atta $1\frac{1}{2}$ chataks.

Tea $\frac{1}{2}$ chatak in the 24 hours.

Butter $\frac{1}{2}$ chatak in the 24 hours.

Midday.

Wheat atta-rice $2\frac{1}{2}$ to 3 chataks.

Pulses 1 to 2 chataks.