

- (1) பக்கத்தின் எண்ணிக்கை _____
(2) புதுக்கித் திருப்பிய நாள் _____
(3) ஆதாரங் குறிப்பவர் சுருக்கொப்பம் _____

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

யோசு துறை

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Chemical Examiner's Reports

Reviewing the
for 1899, forwarding copy
of proceedings to the
of Divis.

OFFICE OF SURGEON-GENERAL

WITH THE GOVERNMENT OF MADRAS,

Fort St. George, 27th March 1890.

No. 290

From

G. Bidie Esq. M.B., C.S.E.

THE SURGEON-GENERAL WITH THE

GOVERNMENT OF MADRAS,

FORT ST. GEORGE,

To

THE Chief Secretary to Government
Public Department

SIR,

I have the honor to submit herewith the annual report of the Chemical Examiner for 1889.

2. The number of medico-legal cases submitted for enquiry amounted to 235, and was therefore 19 in excess of the total in 1888. It further appears that the number of articles which had to be examined in these cases was 123 more than in the previous year.

3. In the miscellaneous department there was also an increase of work, the analyses performed having been 150 in excess of the total for 1888.

4. In para 35 Dr. Van Geyzel brings to notice the difficulty experienced in getting copies of the judgments in medico-legal cases tried in Courts, as directed in G. O. No 1478 of 29th June 1885.

5. The report is as usual interesting and valuable both from a practical and scientific point of view, and shows a large amount of very responsible work well done.

I have the honor to be
Sir

Your most obedient servant

Edie M. B., C.I.E.
Surgeon General
With Govt. of Madras

DL

Public (1890.) DEPARTMENT.
From G. Bidie Esq. M.B.C.S.E.
FIVE SURGEON-GENERAL WITH THE
GOVERNMENT OF MADRAS,
Fort St. George.

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Dated 27 March 1890.
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No.

SUBJECT.

Submits with remarks
the annual report of the
Chemical Examiner for
1889.

14TH APRIL 1890, Nos. , PUBLIC.

GOVERNMENT OF MADRAS.

PUBLIC DEPARTMENT.

READ—the following paper:—

From G. BIDIE, Esq., M.B., C.I.E., Surgeon-General with the Government of Madras, to the Chief Secretary to Government, dated Fort St. George, 27th March 1890, No. 290.

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ENCLOSURES.

From J. L. VANGEYZEL, Esq., M.B., C.M., F.C.S., F.I.C., Acting Chemical Examiner, to the Surgeon-General with the Government of Madras, dated Madras, 25th March 1890, No. 225.

I have the honor to forward the annual report of the Chemical Examiner's Department for the year 1889, for transmission to Government.

From J. L. VANGEYZEL, Esq., M.B., C.M., F.C.S., F.I.C., Acting Chemical Examiner, to the Chief Secretary to Government, dated Madras, 25th March 1890, No. 226.

I have the honor to submit the annual report of the work performed in the Chemical Examiner's Department during the year 1889.

2. In the following table, the analytical work is shown in comparison with that of the preceding year:—

TABLE No. I.

		Number of Cases.		Number of Articles received for examination.	
		1889.	1888.	1889.	1888.
Medico-legal	I. Suspected poisoning (human)	136	127	607	620
	II. Do. blood stains, &c.	29	20	84	88
	III. Do. seminal stains	2	3	3	16
	IV. Do. poisoning of cattle	68	60	191	139
Miscellaneous	For Government departments, Municipalities and private parties	804	654	804	654
Total ..		1,039	870	1,639	1,416

3. The number of medico-legal cases requiring investigation exceeded that of the previous year by nineteen, involving an increase of work indicated by 123 separate analyses in excess of the previous year's number under this section, the total number of articles examined (885) having been exceeded only once during the last ten years, viz., in 1886, when there were 916. In the miscellaneous work of the department also there was an increase during the year under review, represented by 150 analyses in excess of the previous year's number, the total number of separate analyses performed being greatly in excess of any previous year's record. The work under this section has been steadily increasing year by year, and has now more than doubled since 1880.

MEDICO-LEGAL SECTION.

I.—CASES OF SUSPECTED POISONING. (HUMAN).

4. There has been a noticeable improvement in the observance of the rules relating to transmission of articles for examination, and only a few instances of disregard of these rules occurred which were at the time brought to the notice of the Surgeon-General. The precautions enjoined with regard to the testing of country spirit for copper, before its use for preservation of human viscera, however, appear to be disregarded. Rectified spirit is what every medical officer is expected to provide himself with for preserving viscera for chemical examinations, but in the event of his being obliged to use country spirit, knowing how frequently such spirit is contaminated with copper, it is necessary that he should avoid the risk of complicating the case by using such spirit unless he has previously ascertained, as far as possible, that no copper is contained in it. This obligation can be readily discharged by carrying out the test previously described—a test which it is in the power of even a hospital assistant to carry out without any difficulty.

5. Out of 136 cases requiring the examination of 607 articles, poison was detected in 90, or 66.18 per cent. of the cases examined—an unprecedentedly high figure, the highest hitherto recorded having been 57.48 per cent. in 1888. The usual information regarding these cases of human poisoning is shown in the two tables below:—

TABLE II.—Human Cases—Class A.

Including cases in which viscera or evacuations were examined, with or without suspected substances, food, &c.

District received from.	Number of cases.	Number of cases in which poison was detected.	Number of individuals affected.	Number of deaths.	Number of analyses.	Poisons.										
						Inorganic.										
						Arsenious Oxide.	Mercuric Salt.	Opium.	Arsenious Oxide and Resin.	Arsenious Oxide, Hydrochloric Acid and Sulphuric Acid.	Arsenious Oxide and Metacuric Salt.	Bangle-glass Powder.	Copper Sulphate.	Chinabar and Arsenious Oxide.	Arsenious Oxide and Antimony.	Arsenious Oxide, Resin and Strychnine.
Arco, North	1	2	3	3	40	1	1	1	1	1	1	1	1	1	1	1
Arco, South	7	5	14	5	35	2	1	1	1	1	1	1	1	1	1	1
Bellary	2	2	2	2	11	1	1	1	1	1	1	1	1	1	1	1
Canara, South	5	2	5	4	15	2	2	2	2	2	2	2	2	2	2	2
Chingleput	2	4	5	4	3	1	1	1	1	1	1	1	1	1	1	1
Coimbatore	1	2	1	2	9	1	1	1	1	1	1	1	1	1	1	1
Cundapah	2	2	2	4	32	2	2	2	2	2	2	2	2	2	2	2
Ganjam	6	6	12	4	24	1	1	1	1	1	1	1	1	1	1	1
Godavari	4	4	10	6	67	1	1	1	1	1	1	1	1	1	1	1
Kistna	9	8	18	5	72	2	2	2	2	2	2	2	2	2	2	2
Krishna	12	8	21	10	31	1	1	1	1	1	1	1	1	1	1	1
Kurnool	7	4	9	2	35	1	1	1	1	1	1	1	1	1	1	1
Madras	6	4	6	2	30	1	1	1	1	1	1	1	1	1	1	1
Madura	2	3	8	2	12	1	1	1	1	1	1	1	1	1	1	1
Malabar	2	3	8	2	8	1	1	1	1	1	1	1	1	1	1	1
Nellore	4	1	6	1	6	1	1	1	1	1	1	1	1	1	1	1
Nizamis	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1
Salem	2	1	2	1	7	1	1	1	1	1	1	1	1	1	1	1
Tanjore	4	2	4	3	24	3	3	3	3	3	3	3	3	3	3	3
Trichinopoly	6	2	12	3	33	2	2	2	2	2	2	2	2	2	2	2
Tinnevely	3	4	7	7	39	1	1	1	1	1	1	1	1	1	1	1
Vizagapatam	4	4	14	3	13	1	1	1	1	1	1	1	1	1	1	1
Total for the year 1889	101	69	159	79	545	21	8	1	1	1	3	1	1	1	1	1
" " 1888	91	51	133	73	446	20	4				2					

Including cases in which viscera or evacuations were examined, with or without suspected substances, food, &c.—*cont.*

[illegible]

Including cases in which no viscera or evacuations were received for examination, but only suspected substances, food, &c.

Districts received from.	Poisons.																		
	Number of cases.	Number of cases in which poison was detected.	Number of analyses.	Inorganic.					Organic.										
				Arsenious Oxide.	Mercuric Salt.	Opium.	Arsenious Oxide and Lead Sulphide.	Red Oxide of Mercury.	strychnine.	Calotropis Gigantea.	Ganjah.	Nux Vomica and Abus Precatorius.	Opium.	Atropine.	Aconite.	Ganjah and Opium.	Ganjah and Datura.	Oduran.	Assafetida
Anantapur	2	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Arcot, North	5	2	10	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Arcot, South	3	1	9	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Bellary	2	2	6	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..
Canara, South	2	1	3	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Coimbatore	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cuddapah	2	2	3	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..
Ganjam	2	1	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Godavari	1	1	3	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Kistna	1	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Karnool	4	3	8	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Madura	4	3	6	2	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Nellore	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Salem	2	2	2	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Trichinopoly	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tinnevely	2	2	4	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total for 1889	35	21	62	9	2	2	..	..	1	2	2	1	1	1	2	..	1	1	..
" " 1888	36	22	74	8	..	..	1	1	..	1	1	..	2	2	2	1	1	1	..

Group I—consisting of twenty cases in which only symptoms (such as nausea or vomiting) occurred under circumstances which aroused suspicion, but without a fatal result; and *Group II*—of twenty-six cases in which a fatal occurrence was reported to have occurred under suspicious circumstances.

Group I.—In many of these cases the nature of the articles sent preclude the possibility of more than a partial examination being carried out, e.g., the search for a vegetable poison in three or four large chatties containing earth picked up from the floor of a house or from a dust-pit in the backyard and labelled "Vomited matter," "Remainder of food," &c., is a hopeless task and has often to be abandoned for more useful work. Frequently, again, only articles having some indirect and often uncertain connection with the case are forwarded, and when discovered to be non-poisonous are not credited as detections, although their identification may have involved an extended examination. An instance of *varagu poisoning* reported from Tindivanam, fortunately without fatal consequences, may be noted here. Thirty-one persons, after eating new grain purchased in the local bazaar, were attacked "with vomiting followed by giddiness and inability to stand upright, their eyes were jaundiced, they could not recognise bystanders and they became semi-comatose for three days. The vomiting in some cases was so severe that no nourishment could be given by the mouth for two days. Nine of them also had fever after the third day." Poisoning as a result of eating this grain is occasionally met with in India in the same way that darnel poisoning occurs from eating bread made of flour in which accidental intermixture of the seeds of this grass with wheat has occurred; the symptoms of *varagu poisoning* also resemble those of darnel poisoning, so much so that it has been suggested that *varagu poisoning* is really poisoning by darnel which has been accidentally introduced. In the present case a most careful search was made for foreign grain, and the samples sent were examined chemically and microscopically without discovering any difference between them and locally purchased grain; samples were also sent to Dr. Thurston, who reported to the same effect. The precise nature of the poison in darnel and in *varagu* is unknown. It is believed that the *varagu* grain raised at the proper season is wholesome, while that raised on the same ground as a second crop and that raised on wet marshy ground are unwholesome, and it is also said that only the new grain exhibits poisonous properties; but these statements do not appear to be based upon reliable observations. The possibility of the grain being diseased has also been suggested, and Dr. Bonavia of Bengal "thinks after rain falls and the ear is ripening, a fungus attacks it and

it is this which is to blame, and that washing the grain previous to cooking it renders it harmless." Various cereals are liable to become poisonous when attacked by fungus, and outbreaks of ergotism arising from the use of the affected grain as food are well known; a disease appears in eumbu in which the affected grain is said to resemble ergot of rye, but I have not been able to discover any instances in which eumbu has proved poisonous, nor does there seem to be any authentic discovery of disease in varagu to account for its occasional poisonous behaviour. The poisonous grain does not appear to be the product of a variety but of the plant which yields the healthy grain. An instance of poisoning by eating cholam grain, apparently diseased, recently occurred in the Anantapur district, but the examination of the grain has not yet been completed.

Group II.—In this group of twenty-six cases, there were reported to be twenty-seven deaths, and from the information furnished regarding them, the notes of *post-mortem* examinations, and medical officer's certificates, &c., they are divisible into three sub-groups:—

- (a) Cases in which the evidence of death being due to disease or injury preponderates over the evidence in favor of the suspicion which necessitated chemical investigation:—

	Deaths.
Cholera	4
Hæmorrhage and septicæmia following abortion, and other accidents of pregnancy	6
Suicidal hanging	1
Paralysis, phthisis, &c.	5
Total	16

- (b) Cases in which, while there is insufficient or no evidence in favor of a disease cause, there is also little or no evidence in favor of the death having resulted from the administration of a poison. In six cases the sole ground for suspicion rested on the fact that death was sudden; the majority of these died after suffering from symptoms resembling those of cholera, one probably from infantile convulsions, and another during a drinking bout. The seventh case was that of a man who died without recovering consciousness after admission into hospital; at the *post-mortem* examination the evidence of death being due to "an old clot in the basilar artery of the brain" was considered insufficient, and the viscera were forwarded for chemical examination. In the eighth case it was reported that a man went out after supper to watch his straw heap in the field and was found dead there next morning. He was the husband of three wives, and to clear up suspicion which fell on the youngest wife, the local medical officer made a *post-mortem* examination and certified that death was caused by "coma, the result of sudden shock due to a severe fright," corroborating in a way the verdict of the panchayat, who recorded that the man was "struck dead by a devil because he went alone at night after having sexual intercourse with his wife." After the burial of the corpse the two older wives produced further evidence against the youngest wife, her father and three others, and consequently exhumation was ordered with the view of sending the viscera for chemical examination. In the meantime the grave had been disturbed (by animals?), no viscera could be found, and only some pieces of bone and earth from the grave were obtained and forwarded, in which no poison was detected.

- (c) Cases in which the balance of evidence appears to be in favor of death by poison, but in which no poison was detected:—

- (1) A girl, after eating some root (suspected to be oleander), suffered from nausea and giddiness, became insensible, and died. *Post-mortem* examination revealed intense congestion of stomach and intestinal tract.
- (2) A man, having quarrelled with his wife, swallowed "the juice of some leaves," suffered from vomiting, and died two days after. *Post-mortem* examination afforded no clue to the nature of the poison.
- (3) A man was found dead in the house of a prostitute, and the medical officer certified that the *post-mortem* signs were "not inconsistent with alcoholic poisoning;" the medical officer was unfortunately not made aware of the suspicion of death being due to alcohol till after he had added spirit to the viscera secured for chemical examination.

7. Of the 90 cases in which poison was detected, inorganic poisons were discovered in 49 and organic poisons in the remaining 41. The total number of deaths ascertained to be due to the effects of poison was 53 (including 1 in Class B), of which 39 were homicidal (including six deaths in cases of criminal abortion), 12 were suicidal, and 2 doubtful.

Inorganic Poisons.

8. The more important details of the cases in which poisons of this class were detected are furnished below with the corresponding details for four previous years:—

TABLE IV.

	1889.	1888.	1887.	1886.	1885.
Cases included in Class A	36	31	40	45	34
Class B	13	10	11	13	11
Number of individuals affected in A and B	98	76	90	98	91
" of deaths in A and B	25	21	30	24	22

As usual, the preparations of arsenic alone, or together with some other poison, head the list in the order of frequency.

9. The following cases of *arsenical poisoning* may be briefly noted:—

- (a) A man shortly after eating a meal was seized with vomiting and purging and died. Suspicion of poisoning fell upon his mother, who it was said was instigated by her paramour. The body was exhumed some days after, and five-hundredths of a grain of white arsenic were found in the portions of the body sent; some substance subsequently found in the evacuations contained nineteen grains of white arsenic.
- (b) A woman, who introduced into her husband's food "some medicine in order to regain his affection," failed to secure her object by his very narrowly escaping death; four-fifths of a grain of white arsenic being found in a small portion of the food which was left.
- (c) A case of suicide by arsenic which was admitted into one of the hospitals in Madras is remarkable for the magnitude of the dose which must have been taken, nearly two hundred and sixty-five grains of white arsenic having been extracted from the viscera and vomited matter.
- (d) An attempt to poison a brother was frustrated by the offender being discovered in the act of putting some white powder (two grains and a half of white arsenic) into the drinking-water pot.
- (e) A rich ryot and twenty-three servants of his suffered from severe vomiting and stomach-ache for eighteen hours after eating their mid-day meal. White arsenic was found in the remainder of the food and in the vomited matter sent.
- (f) Two girls went to the river for "poojah," where the Brahmin gave them sugar and plantains; shortly after eating these, they were both seized with the usual symptoms of arsenical poisoning and one of them died in a few hours.
- (g) A man married a second wife, whom he brought home in spite of the remonstrances and threats of the first wife, and the latter poisoned him with arsenic.
- (h) In return for some slight services rendered to a neighbour, a man received a present of sweetmeats, which he shared with his wife and three children; after eating it, they all suffered from vomiting and purging caused by white arsenic, eight grains of which were extracted from the remainder of the sweets.
- (i) A man lost two of his children in one night, and six days after burial the corpses were exhumed, as the father began to suspect foul play. A milkman, who he now learnt was very friendly with his inveterate enemy, was in the habit of gratuitously supplying milk for his children during ten days previous to their death, and a double quantity was supplied on the night on which they took ill after supper. The baby died in two hours, and a lad 4 years old in three hours; the remnant of milk and evacuations were not procurable, but arsenic was found in the exhumed viscera.

10. *Mercurial Compounds* were discovered alone in ten cases and together with arsenious oxide in three cases, of which the following may be briefly mentioned:—

- (a) As an instance of rankling jealousy long after it had been provoked. A woman was discarded by her husband during her pregnancy which he suspected to be the result of infidelity to him; and he was jealous of the child which she gave birth to. In a fit of revenge four years after he contrived to send poisoned plantains to this child and destroyed it.
- (b) As an example of wanton cruelty perpetrated apparently in the absence of provocation, the following could scarcely be surpassed. Some persons forcibly held down a woman, and rubbed some stuff (Perchloride of Mercury) into her mouth and elsewhere. She consequently suffered all the agony of severe mercurial poisoning with sloughing of the mucous passages which came in contact with the poison, the *post-mortem* examination revealing a shocking state of things. The woman died after nine days, but traces of mercury were obtained from the liver and kidney.
- (c) As an example of native medical treatment which is now-a-days not so frequently heard of. A young married woman who was turned away by her husband became pregnant through illicit intercourse, and with the connivance of her paramour procured abortion in the following manner:—"A snake-charmer woman gave her some

medicine (mercurial) and introduced an abortion stick into the womb; she was then placed on her back, held firmly down, and severely trodden on the abdomen. This was repeated at intervals through the day, each operation being preceded by a dose of the medicine; after the third operation she could no more walk about and complained of great pain, and the treatment was discontinued for the night. Next day it was commenced again and continued at intervals till the afternoon, the woman's agonies increasing all the while and ending in the expulsion of the fetus and death of the mother. The *post-mortem* signs (notes of which were most carefully recorded) fully corroborated the above account.

11. *Bangle-glass*.—A woman gave her bangles to a man (who it turned out was at enmity with her husband) on his promising to give her something in return to put into her husband's food which would stimulate his waning affections for her. The husband discovered a piece of glass which stuck on his tongue during a meal, and his wife confessed what she had done. The vomited matter and remainder of food contained a good deal of coarsely-powdered blue glass, such as native bangles are made of.

Organic Poisons.

12. The use of this class of poisons has increased very much during the last two years. During the four years 1884—87, the percentage of organic poisons to total poisons detected ranged in round numbers from 33 to 18 in a declining ratio; in 1888, the percentage rose to 43.8, and in the year under review to 45.6. The following table shows comparatively for five years the more important particulars of the cases in which organic poisons were detected:—

TABLE V.

	1889.	1888.	1887.	1886.	1885.
Cases included in Class A	33	20	9	5	13
Class B	8	12	2	11	6
Number of individuals affected in A and B	69	51	20	47	26
" of deaths in A and B	28	17	9	2	7

13. *Aconite* was detected alone in seven cases, with opium in one case and ganjah in another.

- Four boys were poisoned—two fatally—by stealing toddy from the pots tied to the date tree. The toddy climber had evidently poisoned the toddy in order to deter future robbers.
- A woman after some disagreement with her husband left the house ostensibly to collect firewood. As she did not return in the evening, a search was made and she was found dead in the dry river-bed.
- A priest and his family (seven persons in all) suffered from well-marked symptoms of aconite poisoning an hour after eating food which had been sent by a brother of the same cloth, ending in the death of three of them.
- A man complained of uneasiness in stomach two hours after a meal, followed by other well-known symptoms of aconite poisoning, and died in four hours. His wife had put "some powder" in his curry at the instigation of a more favored companion.

14. *Opium* was detected in four cases and in three others the alkaloid *Morphine* was extracted from the viscera sent. In one of these cases the medical officer had fortunately secured and sent the urine which was found in the bladder during the *post-mortem* examination, for, as it happened, the alkaloid was readily extracted from this article when only doubtful evidence of its presence in position better than morphia; but my experience is contrary to this, inasmuch as morphine has been detected in many instances where no evidence of meconic acid was forthcoming. It is not, however, probable that in these cases the more expensive alkaloid in its pure state would have been employed by the poisoner when crude opium is always so readily obtained; and morphine is an alkaloid which resists decomposition well, Stas having found it thirteen months after burial. The constituents of opium are known to undergo partial destruction in the animal body, but a portion appears constantly in the secretions, particularly morphine in the urine, the elimination from a single dose extending over five or six days. In opium poisoning there is some loss of power over the bladder, and at the *post-mortem* the bladder is usually found full of urine; so that the conditions for detection of this alkaloid after death are most favorable. It would therefore be well if medical officers would bear this in mind during *post-mortem* examinations, for it is the exception for them to send urine collected at such examinations and the rule to concentrate attention upon the "stomach and contents," when in all probability the poison has passed through this organ long ago.

15. *Ganjah* was found alone in six cases, with datura in one, and in another with aconite already referred to.

- Some food declared to have been given to a man with intention to cause his death was found to contain a large amount of ganjah.
- An intemperate civil apothecary appealed to a native quack for something to turn him from his vicious habit, and he died fourteen hours after taking the reputed cure; the remainder of the medicine turned out to be ganjah, evidence of which was also obtained from the stomach and contents.
- A man was seized with vomiting immediately after drinking arrack; ganjah was found in the vomited matter, also in the remainder of the arrack.
- Five persons fell in on a journey with a stranger who cooked the food for their mess, supplied his own wants, and disappeared. The five men soon after their meal "got mad," wandered about the village, and were taken into custody by the police; they suffered from dryness of throat, hoarseness, disordered vision and talked incoherently as if drunk. The vomited matters sent for examination contained ganjah.

16. *Datura* and *Atropine* were found in four cases alone, and mixed with ganjah in one case. In three cases returned under *Datura*, parts of the plant used were also sent and were identified; in the other two cases returned as *Atropine*, a mydriatic alkaloid was isolated:—

- Three chucklers who were in the habit of stealing toddy off the trees became more than usually intoxicated on one occasion, and one of them who drank a larger quantity than the others became insensible and died. *Atropine* was extracted from his stomach and from the toddy, in which were also found datura seeds.
- In another a woman committed suicide, owing to a quarrel with her husband, by eating the datura fruit; the seeds were found in her stomach, from which also the alkaloid was obtained.
- Four persons became delirious after eating a pudding, and one of them also became insensible and died; from the deceased's stomach atropine was extracted.

17. *Calotropis Gigantea* was identified in four cases; in one of them an abortion stick was armed with the juice of this plant, and the remaining three were suicidal cases, in each of which the wife, owing to a quarrel with her husband, drank the juice of this plant, with fatal result in one case. The chief symptoms observed were nausea and faintness.

18. *Strychnine* was detected in four cases—in a child which died in convulsions four hours after taking a "worm powder" prescribed by a native quack; in a Brahmin widow who did not wish to survive the disgrace of her pregnancy; and in the case of a woman who committed suicide because of a quarrel with her husband. In the fourth case, the corpse of a woman was dragged out of a well, and as the cause of death could not be ascertained at the inquest, the body was conveyed to the local dispensary by the police; on getting ready for the *post-mortem* examination, a dead fetus dropped out of the winding sheet to the astonishment of the by-standers. There were no signs indicating that any attempt to cause abortion had been made, there were no signs of drowning, the fetus was seven or eight months old, and its delivery was accompanied by total inversion of the uterus. Under these circumstances, the woman also being a widow, it was suspected that she died from the result of a drug taken to procure abortion and that her paramour had cast the corpse into the well to veil the cause of death. *Strychnine* was found in the viscera sent. The occurrence of childbirth after the life of the mother had become extinct, without the aid of art and indeed even after interment, has been recorded and avouched by many observers of established credit; the independent contractile power of the uterus, or cadaveric rigidity, being stated to be the chief factors in the production of this accident. So-called "Cadaveric spasm" also is known to occur at or after death by strychnine poisoning and to persist till true cadaveric rigidity comes on, disappearing only with it. In the present instance the body must have lain for about eighteen hours in the water; cadaveric rigidity had all but passed away at the time of examination (only the upper limbs being slightly stiff), and, no doubt, expulsion of the fetus occurred by the pressure of the gaseous products of putrefaction which filled the abdomen. The possibility of this accident occurring is a point in obstetric jurisprudence which should not be forgotten when examining the dead body of a female alleged to have miscarried.

19. *Abrus Precatorius*.—Four persons suffered from vomiting and purging after eating ragi porridge into which "some red substance" had been put. The suspected substance sent was identified as the seeds of this plant. Seeds of the white variety were identified mixed with nuxvomica seeds in another case of suspected attempt to poison. This is the well-known "Gundumani" employed for poisoning cattle by "Sui" referred to in last year's report.

20. *Plumbagin* was detected in a corpse found in a well without signs of death by drowning and without any further information to throw light on the circumstances of the death; and in a case of a woman in whom *post-mortem* signs of recent delivery were found, the root of the *Plumbago Zeylanica* being an abortifacient of old reputation.

21. *Oduman*.—A pregnant widow died from symptoms of gastro-intestinal irritation after taking an abortifacient; from her stomach was extracted a non-alkaloidal poison which gave the reactions similar to those obtained from the extract of this plant (*Lebedicopsis Orbicularis*).

22. Fourteen cases included under other headings referred to the offence of *criminal abortion* and there were twenty-nine instances of *multiple poisoning*, the largest number of individuals affected and of deaths in any single case being respectively 7 and 3. The largest number of persons affected without any death occurring was 24 in an arsenical case.

23. There was only one case in which the poison extracted could not be identified. A child four months old died soon after being given some medicine by a quack; a poisonous alkaloid was extracted from the viscera which produced paralysis of voluntary movements and of respiration in the frog. The body was said to have been highly decomposed, but the alkaloidal obtained did not respond to the ordinary tests of a "Ptomaine."

II.—BLOOD STAINS.

24. The usual information regarding these cases is given in the following table:—

TABLE VI.—Blood Cases.

Districts received from.	Number of cases.	Number of cases in which blood was detected.	Number of examinations.
Anantapur	1	1	8
Arcoot, North	2	1	7
Arcoot, South	1	..	9
Bellary	5	4	14
Coimbatore	1	1	1
Cuddapah	6	2	10
Kistna	3	2	11
Kurnool	1	1	2
Madura	1	1	1
Salem	2	1	8
Tanjore	2	1	9
Tinnevely	3	3	3
Vizagapatam	1	1	1
Total for the year 1889 ..	29	19	84
" " 1888 ..	26	20	88

Eighteen of the cases in which examinations for blood were conducted were connected with the crime of murder, three with wounds by stabbing, two with rape, one with abortion, and in five cases no particulars were received. Of the nineteen cases in which the presence of blood was established, the stains in seven were discovered to be due to mammalian blood.

The possibility of *distinguishing human blood* in fairly recent stains, containing not very minute quantities of blood, appears to be established by a research recently carried out by Dr. Monckton Copeman, his method depending on the different way in which the hæmoglobin of the blood crystallises in different animals. Hæmoglobin is not crystallisable from normal human blood, but it was known that crystals of it appeared in blood taken from patients suffering from pernicious anaemia, and mounted under the microscope. To imitate the condition of the blood in this disease, normal blood was diluted with sheep's serum and mounted, and it was found that when fresh serum was added no crystals appeared, but that they appeared readily if the serum had become decomposed. It was observed that the crystals obtained from human blood by this, and other methods also, always consisted of *reduced hæmoglobin*, while the blood of a large number of other mammals examined crystallised as *oxy-hæmoglobin*, these two varieties of hæmoglobin being readily distinguishable, with the aid of a microspectroscope, by their characteristic absorption bands. So far only one exception has been met with, viz., the blood of the monkey, from which hæmoglobin crystallises as reduced hæmoglobin, but the crystals are fortunately of a different shape from human hæmoglobin.

III.—SPERMATIC STAINS.

TABLE VII.

Districts received from.	Number of cases.	Number of cases in which semen was detected.	Number of examinations.
Kistna	1	..	2
Madura	1	..	1
Total for the year 1889 ..	2	..	3
" " 1888 ..	3	1	15

25. Both the examinations referred to the crime of rape, but said to have been committed under circumstances which made the charges apparently fictitious. Two of the cases in which mammalian blood was discovered (under Blood Stains) also referred to the crime of rape, but no sperms could be detected even in those stains, though in one of these cases the guilt of the accused was established from other evidence. Suspected spermatic stains require much greater care in packing than even blood stains, as the very slightest pressure or friction is sufficient to crush the sperms and to cause the microscopic examination to fail in their detection. As a rule, these stained articles pass through so many hands before reaching this office, that the result of the examination is usually doomed to end in failure.

IV.—CASES OF SUSPECTED CATTLE-POISONING.

26. The following tabular statement exhibits the chief particulars of these cases, arranged as in human cases under Classes A and B:—

TABLE VIII.—Cattle Cases.

Districts received from.	Class A.								Class B.						
	Number of cases.	Number of deaths.	Number of cases in which poison was detected.	Number of analyses.	Nature of Poison.				Number of cases.	Number of cases in which poison was detected.	Number of analyses.	Nature of Poison.			
					Arsenious Oxide.	Calatropis Gigantea.	Mercuric Salt.	Picrotoxin.				Arsenious Oxide.	Arsenious Oxide and Orpiment.	Ganjah.	
Anantapur ..	6	8	3	21	3	..	..	..	..	..	8	..	..	..	..
Arcoot, North ..	..	..	..	..	..	..	..	..	..	2	..	1	..	..	..
Bellary ..	1	1	1	4	1	..	..	..	..	..	1	..	1	..	..
Coimbatore ..	8	11	7	26	7	..	..	..	..	2	2	..	..	..	..
Cuddapah ..	1	1	1	3	1	..	..	..	..	..	2	..	..	..	..
Ganjam ..	4	4	2	13	2	..	..	..	..	2	6	..	..	..	..
Godavari ..	4	5	3	16	3	..	..	..	..	2	2	..	..	..	..
Kistna ..	4	4	2	13	2	..	..	..	..	2	2	..	..	..	..
Kurnool ..	2	3	2	6	2	..	..	..	..	..	..	..	..	..	..
Madras ..	1	1	..	3	..	..	..	..	..	..	..	..	..	..	..
Madura ..	3	3	1	13	1	..	..	..	..	..	..	..	..	..	..
Malabar ..	..	..	..	..	..	..	..	..	..	1	1	1	..	..	..
Nellore ..	4	4	3	15	2	1	..	..	..	2	3	2	..	..	..
Salem ..	..	..	..	..	..	..	..	..	..	1	1	1	..	..	..
Tanjore ..	3	5	3	17	3	..	..	..	..	2	1	4	..	..	..
Trichinopoly ..	..	..	..	..	..	..	..	..	..	2	2	3	2	..	..
Tinnevely ..	1	2	..	2	..	..	..	..	..	2	2	2	1	..	1
Vizagapatam ..	..	..	..	..	..	..	..	..	..	1	1	1	..	..	..
Bangalore ..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..
Total for 1889.	43	53	28	153	27	1	..	..	25	20	38	18	3	..	1
„ „ 1888.	38	49	20	116	25	..	2	1	22	16	23	15	1	..	..

The number of cases sent up for examination during the year was slightly in excess of those of the two preceding years, the percentage of detections being 70.6, which is the same as last year, though the number of analyses required to be performed was half as many again. The chief instrument of poisoning was, as usual, white arsenic, and there are no cases calling for special remark.

MISCELLANEOUS SECTION.

27. The total number of analyses performed under this heading was 804, of which 34 were for private parties and the rest on behalf of the various Departments of Government, Municipalities, &c.

Much of the work performed in this section, in order to answer questions upon technical matters referred for opinion, &c., cannot be expressed in figures, and is not apparent from the following table:—

EXAMINATIONS made for Government Departments, &c.

Received from	Nature of substance.	Number of examinations.	Total number of examinations for the year.
Board of Revenue	Earth	1	370
	Salt	299	
	Spirits	4	
	Malt liquor	25	
	Dhobies' Earth	39	
	White pills and powder	1	
	Intoxicating drug	1	
Commissariat Department	Rum	6	109
	Nitre	1	
	Malt liquor	87	
	Carbolic powders	8	
	Hay	4	
	Brandy	1	
Chemical Laboratory	Tin	2	19
	Dhobies' Earth	1	
Collector, South Arcot	Rain-water	18	2
	"Droque Amere"	1	
Collector (Sub), Tinnevely	"Elixir"	1	3
	Wine	3	
Collector of Sea Customs	Raspberry Champagne coloring	1	103
	Essence of Cochineal	1	
	Do. of Vanilla	1	
	Do. of Almonds	1	
	Orange Bitters	1	
	Lemon-juice	1	
	Spirit: Ether: Nitros:	1	
	Sulphuric Ether	1	
	Premier Ginger Ale Extract	1	
	Lime-juice Cordial	3	
	Coca wine	1	
	"Greek Indian Remedy"	1	
	"Medicine"	1	
	Spirits	18	
	Beer heading	1	
	Kerosine oil	28	
	Cylinder oil	1	
	Engine oil	1	
	Lubricating oil	2	
	Petroleum, Stockholm	1	
	Methylated Spirits	16	
	Do. Ether	2	
	Caoutchoucine	3	
	Dynamite	7	
	Gelatine dynamite	3	
	Blasting gelatine	4	
	Gelignite	1	

Examinations made for Government Departments, &c.—cont.

Received from	Nature of substance.	Number of examinations.	Total number of examinations for the year.
District Medical Officer, Kurnool ..	Opium	1	1
Do. do. Coimbatore ..	Suspected drug	1	1
Do. do. Trichinopoly ..	Arrack	1	3
	Opium	1	
Do. do. Rajahmundry.	Bark	1	5
	Drugs, including Ganjah	4	
Deputy Magistrate, Salem	Opium	1	5
Deputy Surgeon-General, Eastern District, Madras.	Spirits	2	2
Executive Engineer, Military Works, Fort St. George.	Water	3	3
Executive Engineer, Presidency Division.	Sand for filter bed	1	1
Government of Madras	Water	5	5
Inspector-General of Ordnance	Quinine Sulphate	1	1
Inspector of Salt and Abkari Revenue, through District Medical Officer, Coimbatore.	Coal	4	4
	Suspected intoxicating drug.	1	1
Jail Department.	Inspector-General of Jails	4	49
	Medical officer, H.M.'s Penitentiary, Madras.	2	
	Do. Coimbatore	1	
	Do. Cholema Camp, Coimbatore.	1	
	Do. Cuddapah	1	
	Do. Bellary	1	
	Do. Cuddalore	1	
	Do. Vellore	1	
	Superintendent, Central Jail, Trichinopoly.	6	
	Superintendent, Central Jail, Coimbatore.	7	
	Superintendent, Central Jail, Cannanore.	8	
	Superintendent, Hill Jail, Parvathipur.	1	
	Joint Magistrate, Chingleput	1	
	Medical officer, 9th M.N.I.	1	
Municipalities.	Do. 22nd do.	1	24
	Tanjore	4	
	Dindigul	1	
	Madras	7	
	Cuddapah	7	
	Madura	2	
	Salem	4	
	Nilgiris	2	
	Do.	1	
	Do.	1	
Ordnance Officer, Arsenal, Madras ..	Coal-tar	4	5
	Rangoon oil	1	
	Chloral Hydrate	1	
Principal Medical Storekeeper, Madras.	Subnitrate of Bismuth	2	12
	Standard solutions for water analyses.	9	
Principal, Medical College, Madras ..	Standard solutions for water analyses for Hygiene class.	2	2
Presidency Magistrate, Madras	Opium	1	1

Examinations made for Government Departments, &c.—*cont.*

Received from	Nature of substance.	Number of examinations.	Total number of examinations for the year.
Superintendent of Telegraph Stores, Madras.	Bichromate of potash ..	1	2
	Sulphate of copper ..	1	
Superintendent of Stationery, Madras ..	Inks	27	27
Do. Central Museum, Madras ..	Water	1	1
Do. Gun Carriage Factory, Madras ..	Yellow soap ..	1	
	Tin	1	2
Superintending Engineer, V Circle ..	Water	2	2
Senior Medical Officer, Station Hospital, Madras.	Do.	1	1
Senior Medical Officer, Station Hospital, Wellington.	Ale	1	
	Tin	1	2
	Water	10	
	Ale	6	
	Porter	5	
	Asiatic Ale ..	1	
	Sulphate of Quinine ..	1	
	Damaged paper ..	1	
	Blue-black Ink ..	1	
Private Parties and Firms	Saccharometer ..	1	
	Poudrette	1	
	Raw Bone Meal ..	1	
	Steamed do. ..	1	
	Bone-meal Manure ..	1	
	Ragi flour	1	
	Cocanut oil	1	
	Suspected substance ..	1	
	Kalloy	1	34
	Total	804	804

28. *Salt*.—Nearly 300 analyses were made for the Board of Revenue, the work being more than enough to keep fully occupied the two Salt Assistants of the establishment sanctioned in 1886.

29. *Dhobies' Earth*.—Forty samples were examined from various districts, chiefly with the view of ascertaining their carbonate of soda value and a cheap method of extracting the soda crystals, in order to establish local factories, if it could be shown that the product was obtainable on a scale which would admit of its competing with the imported article. The result of the experiments did not favor any outlay being incurred for testing the question on a large scale. In this connection it might be mentioned in passing that an inquiry into a proposal from the Assistant Director of Land Records and Agriculture, viz., to manufacture carbonate of soda and ammonium chloride by the "Soda-ammonia" process by utilising the refuse blood of slaughter-houses for this purpose, also ended unfavorably.

30. *Spirits and Malt Liquors*.—These were examined as to their purity and quality generally, the majority being examined for the Commissariat Department chiefly as to their fitness for issue to troops, including eighty-seven samples of malt liquor and seven of spirits; while twenty-five samples of malt liquor and four of spirits were examined for the Revenue Board.

31. *Petroleum and Explosives*.—Thirty-three examinations were conducted under the Petroleum Act and fifteen under the Explosives Act without a single rejection.

32. Some samples of *Coal* were examined in connection with an inquiry into the cause of the fire which occurred lately in Madras in destroying a large quantity of Government coal. The samples examined were found to be highly charged with iron pyrites, supporting in a measure the theory of the spontaneous origin of the fire. The oxidation of the pyrites which goes on by exposure to air is attended with a rise of temperature quite sufficient under favorable circumstances (especially if the heat developed by oxidation is not conducted away) to cause spontaneous combustion of the coal. Ships carrying coal have been known to take fire from this cause; and the burning cliffs of the Dorsetshire coast are caused by the oxidation of pyritiferous shale which abounds in the Kimmeridge clay.

33. *Customs Department*.—A large number of examinations, as usual, was made for this department, chiefly drugs and other articles suspected to contain alcohol, with a view to aid in determining the amount of duty to be levied; also samples of methylated spirit as to whether they were sufficiently spoiled according to the orders of Government. Of sixteen samples of methylated spirit examined, four did not pass, as *pure* wood spirit instead of *crude* had been used in their methylation. The orders of Government on this point do not appear to be widely enough known, for parties in ordering methylated spirit from home apparently do not particularly ask that the spirit should be spoiled with *crude* wood naphtha. English methylated spirit which, though it contains the prescribed proportion of wood spirit, is not, within the meaning of the orders of this Government, "sufficiently methylated so as to render it unfit for use as a beverage." Indeed, the fact had been for a long time past practically demonstrated by the large sales to the public which chemists and druggists effected of methylated spirit on Sundays, especially in Scotland, on which days public houses are closed. To such an extent was this practice of drinking methylated spirit on Sundays carried that by recent legislation a chemist and druggist is forbidden to sell such spirit between Saturday night and Monday morning except under a penalty of hundred pounds.

34. *Waters*.—The majority of these were examined as to their fitness for drinking, and a few as to their fitness for boiler purposes, viz., twenty-four samples on behalf of Municipalities, seventeen chiefly for the Military Department, forty-five for the Jail Department, and ten for private parties. In addition to these, eighteen examinations of *Rain-water* were made during the year, the general increase of other work preventing these examinations being conducted as frequently as hitherto. The results of these examinations are given in the table below:—

ANALYSES of Madras Rain-water—Monthly Results, 1889.

	January.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Rainfall Inches	0.05	2.05	0.01	1.08	5.57	4.36	5.86	7.47	5.08	11.85	43.38
Total combined Nitrogen (as N. H. 3) .. lb. per acre	0.001	0.072	0.007	0.037	0.224	0.369	0.277	0.422	0.313	0.392	2.114
Chlorine (as Na. cl.) .. do.	0.092	3.82	0.018	2.014	9.334	6.890	7.532	8.363	9.188	22.114	69.369
Solids do.	0.226	9.27	0.045	4.886	21.989	9.863	17.758	21.943	22.102	39.566	147.653
Ash do.	0.113	4.63	0.022	2.443	10.994	4.931	8.076	10.971	11.051	19.783	73.021

Recent researches have shown that plants and soils can absorb nitrogen directly from the atmosphere, and determinations of the quantity of nitrogen as nitrates in rain-water are useful chiefly as evidence of the magnitude of electrical discharges in particular places and at particular seasons, than as an index of the direct fertilising effect of rain. The composition of rain-water is of importance from other points of view as well, and these analyses will be continued regularly till sufficient data are collected for basing any conclusions upon them.

35. In conclusion, I beg to be allowed to bring to the notice of Government the continual disregard of the orders regarding judgments. In paragraph 3 of G.O., No. 1478, Public, dated 29th June 1885, Government directed that "copies of judgments in all cases referred to the Chemical Examiner" should be forwarded to him, and the special attention of Magistrates was again drawn to the subject in paragraph 10 (a) of G.O., No. 535, Public, dated 19th May 1888. Sub-Magistrates sometimes say in reply to my enquiries that "no judgment was passed, the case having been struck off, consequently no copy of judgment was sent;" others, again, say that the case was committed to the District Judge, to whom application should be made; and a Superintendent of Police replied that the orders of Government on the subject referred only to District Magistrates. About forty reminders regarding judgments were sent out by me in September last, and up to date replies of some sort have been received from about half of this number. The medico-legal records in the Chemical Examiner's office would be doubled in value if results of trials and judgments could be obtained for the cases investigated. I have introduced into this report an attempt to classify as far as possible the medico-legal work of the year, but the usefulness of such classification is limited by the want of information as to the actual results of the legal trial in many cases. I therefore beg that Government may be pleased once more to direct more strict attention to the orders upon this subject.

36. The Assistant Chemical Examiner, the two Salt Assistants and the other members of the laboratory establishment, have continued to render efficient aid, and have worked zealously throughout a busy year. The service books of the establishment are up to date.

37. A general statement, including the figures given in the previous tables, is, as usual, given below:—

Nature of work.	Inorganic.						Poisons.												
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Total number of cases.	Total number of articles received for examination.	Total number of cases in which poison was detected.	Total number of cases in which blood was detected.	Total number of cases in which semen was detected.	Arsenious Oxide.	Arsenious Oxide and Iocalgur.	Arsenious Oxide, Hydrochloric Acid and Sulphuric Acid.	Arsenious Oxide and Mercuric Salt.	Arsenious Oxide and Cinnaibar.	Arsenious Oxide and Antimony.	Arsenious Oxide, Iocalgur and Strychnine.	Arsenious Oxide and Lead Sulphide.	Arsenious Oxide and Orpiment.	Mercuric Salt.	Orpiment.	Copper Sulphate.	Red Oxide of Mercury.	Bamboo-glass Powder.
1																			
Human cases { Class A	101	545	69	..	..	21	1	1	3	..	..	..	..	..	8	1	..	..	1
" B	35	62	21	..	..	9	..	..	..	..	..	..	..	..	2	2	..	..	..
Blood stains	29	84	..	19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Seminal stains	2	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cattle cases { Class A	43	133	28	..	..	27	..	..	..	..	..	..	..	..	..	..	..	..	..
" B	25	38	20	..	..	18	..	..	..	..	..	..	..	..	..	..	..	..	..
Examinations for Government Departments.	770	770	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
For private firms, &c.	34	34	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total for the year 1889	1,039	1,689	138	19	..	75	1	1	3	..	..	..	..	1	10	3	..	..	1
" 1888	870	1,416	118	20	1	68	1	..	2	1	1	1	1	1	6	..	1	1	..

Nature of work.	Organic.																					
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Human cases { Class A " B	7	..	1	1	1	1	..	2	1	4	..	1	3	..	1	1	3	..	..	2	3	1
	..	..	..	..	..	1	..	2	..	2	..	2	..	..	..	..	..	..	..	..	1	..
Blood stains Seminal stains { Class A " B	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Cattle cases { Class A " B	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Examinations for Government Departments. For private firms, &c.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total for the year 1889	7	..	1	1	1	2	..	5	1	2	1	7	1	1	3	1	4	..	..	2	4	1
" " 1888	5	1	..	..	..	3	1	2	1	..	1	5	1	1	..	..	5	1	2	2	..	3

Chemical Examiner's
Report for 1889.

W
Hon. Mr. Hodges C.S.D.

Hon. Mr. Barstow C.S.D.

H.E. The Governor

to 357-60 O.S.D.
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ORDER—dated 14th April 1890, No. 359, Public.

The analytical work done by the Chemical Examiner in 1889 is compared below with that performed in 1888:—

	Number of cases investigated.		Number of articles examined.	
	1889.	1888.	1889.	1888.
<i>A.—Medico-legal Investigations.</i>				
Cases of suspected human poisoning	136	127	697	620
" " cattle poisoning	68	60	191	139
Blood stains, &c.	29	26	81	88
Seminal stains	2	3	3	15
Total	235	216	885	762
<i>B.—Miscellaneous Analyses.</i>				
For Government Departments and Municipalities	70	613	770	613
" private parties and firms	34	41	34	41
Total	104	654	804	654
Grand Total	339	870	1,689	1,416

2. Cases of suspected Human Poisoning.—The number of these cases examined was as follows:—

Year.	A.			B.			Total.		
	Cases in which viscera or evacuations were examined.			Cases in which only suspected food, &c. was received for examination.					
	Total number of cases.	Number of cases in which poison was detected.	Percentage of detections.	Total number of cases.	Number of cases in which poison was detected.	Percentage of detections.	Total number of cases.	Number of cases in which poison was detected.	Percentage of detections.
1888	91	61	56.04	36	22	61.1	127	73	57.48
1889	101	69	68.32	35	21	60	136	90	66.18

3. Of the 90 cases in which poison was detected, inorganic poisons were found in 49, and organic poisons in 41. The annexed table shows that, during the year under review, there were eight more cases in which inorganic poisons were used than in 1888, but the total number of cases was less than in 1886 and 1887 by 9 and 2 respectively:—

Year.	Number of cases detected.	Inorganic poisons.	Organic poisons.	Percentage of Column 3 to Column 2.
1	2	3	4	5
1889	90	49	41	54.4
1888	73	41	32	56.2
1887	62	33	29	82.3
1886	74	47	27	78.4
1885	62	39	23	72.6

Arsenic and its compounds were the agents used in 35 out of the 49 cases of inorganic poisoning, and the principal organic poisons detected were aconite (7 cases), gunjah (6 cases), opium, strychnine, and Calabar bean (4 cases each). In one case of organic poisoning, the poison could not be identified.

4. The total number of ascertained deaths from the effects of poison was 53, or 15 more than in the preceding year. Twenty-five deaths were due to inorganic, and 28 to organic, poisons, as against 21 and 17—the corresponding figures for 1888.

14 TH APRIL 1890, N

5. Cases of suspected Cattle Poisoning or 8 more than in 1888. Poison was detected in no less than 45 of the

6. Blood Stains.—Twenty-nine cases in 19. In the year under review, 84 examined in 19 cases, while in the preceding blood in 20 cases.

7. Spermatie Stains.—Only two cases detected.

8. Miscellaneous Analyses.—The preparation of salt (299 examinations) and distillation of Revenue; of malt liquor for the Commission of Revenue; of kerosine oil for the Collector of Sea Customs; Government, Municipalities and private parties.

9. The attention of officers concerned report:—

- (a) The complaint made in paragraph 14 regarding the testing of opium for the preservation of human viscera.
- (b) The remarks in paragraph 14 regarding opium poisoning.
- (c) The remarks in paragraph 25 regarding suspected spermatic.

10. The report will be communicated to the remarks in paragraph 33 regarding

11. The Government regrets to receive from the Examiner that he experiences difficulty in the results of the legal trial in cases in which the Government again directs that in all the Chemical Examiner, a copy of the judgment of the trial shall invariably accompany the and all District Magistrates will issue the with the foregoing order in future.

12. The Government has perused the report contains evidence of much important work report was submitted this year within the

(True R

- To the Surgeon-General with the Government of
- the Chemical Examiner.
- the Sanitary Commissioner for Madras.
- the Judicial Department.
- the Revenue Department.
- the Military Department.
- the Inspector-General of Police.
- all District Magistrates.
- the Secretary to the Government of Hongkong.

ENDORSEMENT—dated 14 May 1890, No. 14 May
Copy to the Government of

Exd. A. Raitt.

14TH MAY 1890, Nos. 359, 360, PUBLIC.

GOVERNMENT OF MADRAS.

PUBLIC DEPARTMENT.

READ—the following paper:—

From G. BIDIE, Esq., M.B., C.I.E., Surgeon-General with the Government of Madras, to the Chief Secretary to Government, dated Fort St. George, 27th March 1890, No. 290.

I have the honor to submit herewith the annual report of the Chemical Examiner for 1889.

2. The number of medico-legal cases submitted for inquiry amounted to 235, and was therefore 19 in excess of the total in 1888. It further appears that the number of articles which had to be examined in these cases was 123 more than in the previous year.

3. In the Miscellaneous department there was also an increase of work, the analyses performed having been 150 in excess of the total for 1888.

4. In paragraph 35, Dr. VanGeyzel brings to notice the difficulty experienced in getting copies of the judgments in medico-legal cases tried in courts, as directed in G.O., No. 1478, of 29th June 1885.

5. The report is, as usual, interesting and valuable, both from a practical and scientific point of view, and shows a large amount of very responsible work well done.

ENCLOSURES.

From J. L. VANGEYZEL, Esq., M.B., C.M., F.C.S., F.I.C., Acting Chemical Examiner, to the Surgeon-General with the Government of Madras, dated Madras, 25th March 1890, No. 225.

I have the honor to forward the annual report of the Chemical Examiner's Department for the year 1889, for transmission to Government.

From J. L. VANGEYZEL, Esq., M.B., C.M., F.C.S., F.I.C., Acting Chemical Examiner, to the Chief Secretary to Government, dated Madras, 25th March 1890, No. 226.

I have the honor to submit the annual report of the work performed in the Chemical Examiner's Department during the year 1889.

2. In the following table, the analytical work is shown in comparison with that of the preceding year:—

TABLE No. I.

		Number of Cases.		Number of Articles received for examination.	
		1889.	1888.	1889.	1888.
Medico-legal	I. Suspected poisoning (human) ..	136	127	607	620
	II. Do. blood stains, &c. ..	29	26	84	88
	III. Do. seminal stains ..	2	3	3	15
	IV. Do. poisoning of cattle ..	68	60	191	139
Miscellaneous	For Government departments, Municipalities and private parties ..	804	654	804	654
Total ..		1,039	870	1,689	1,416

3. The number of medico-legal cases requiring investigation exceeded that of the previous year by nineteen, involving an increase of work indicated by 123 separate analyses in excess of the previous year's number under this section, the total number of articles examined (885) having been exceeded only once during the last ten years, viz., in 1886, when there were 916. In the miscellaneous work of the department also there was an increase during the year under review, represented by 150 analyses in excess of the previous year's number, the total number of separate analyses performed being greatly in excess of any previous year's record. The work under this section has been steadily increasing year by year, and has now more than doubled since 1880.

MEDICO-LEGAL SECTION.

I.—CASES OF SUSPECTED POISONING (HUMAN).

4. There has been a noticeable improvement in the observance of the rules relating to transmission of articles for examination, and only a few instances of disregard of these rules occurred which were at the time brought to the notice of the Surgeon-General. The precautions enjoined with regard to the testing of country spirit for copper, before its use for preservation of human viscera, however, appear to be disregarded. Rectified spirit is what every medical officer is expected to provide himself with for preserving viscera for chemical examinations, but in the event of his being obliged to use country spirit, knowing how frequently such spirit is contaminated with copper, it is necessary that he should avoid the risk of complicating the case by using such spirit unless he has previously ascertained, as far as possible, that no copper is contained in it. This obligation can be readily discharged by carrying out the test previously described—a test which it is in the power of even a hospital assistant to carry out without any difficulty.

5. Out of 136 cases requiring the examination of 607 articles, poison was detected in 90, or 66·18 per cent. of the cases examined—an unprecedentedly high figure, the highest hitherto recorded having been 57·48 per cent. in 1888. The usual information regarding these cases of human poisoning is shown in the two tables below:—

TABLE II.—*Human Cases—Class A.*

Including cases in which viscera or evacuations were examined, with or without suspected substances, food, &c.

District received from.	Number of cases.		Number of cases in which poison was detected.	Number of individuals affected.	Number of deaths.	Number of analyses.	Poisons.										
	1	2	3	4	5	6	Inorganic.										
							Arsenious Oxide.	Moreuric Salt.	Opium.	Arsenious Oxide and Realgar.	Arsenious Oxide, Hydrochloric Acid and Sulphuric Acid.	Arsenious Oxide and Moreuric Salt.	Bangle-Glass Powder.	Copper Sulphate.	Cinnabar and Arsenious Oxide.	Arsenious Oxide and Anti-mony.	Arsenious Oxide, Realgar and Strychnine.
Arcoot, North	..	..	..	..	..	40	1	..	..	..	..	..	..	..	..	..	..
Arcoot, South	..	..	..	..	..	35	2	..	..	..	..	..	..	..	..	..	..
Bellary	..	..	..	..	..	11	..	..	..	..	..	..	..	..	..	..	..
Canara, South	..	..	..	..	..	15	..	..	..	..	..	..	..	..	..	..	..
Chingleput	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..
Coimbatore	..	..	..	..	..	9	..	..	..	..	..	..	..	..	..	..	..
Cuddapah	..	..	..	..	..	32	..	..	..	..	..	..	..	..	..	..	..
Ganjam	..	..	..	..	..	24	..	..	..	..	..	..	..	..	..	..	..
Godavari	..	..	..	..	..	67	..	..	..	..	..	..	..	..	..	..	..
Kistna	..	..	..	..	..	72	..	..	..	..	..	..	..	..	..	..	..
Kurnool	..	..	..	..	..	31	..	..	..	..	..	..	..	..	..	..	..
Madras	..	..	..	..	..	35	..	..	..	..	..	..	..	..	..	..	..
Madurai	..	..	..	..	..	30	..	..	..	..	..	..	..	..	..	..	..
Malabar	..	..	..	..	..	12	..	..	..	..	..	..	..	..	..	..	..
Mallore	..	..	..	..	..	6	..	..	..	..	..	..	..	..	..	..	..
Nalgiris	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..
Salem	..	..	..	..	..	7	..	..	..	..	..	..	..	..	..	..	..
Tanjore	..	..	..	..	..	24	..	..	..	..	..	..	..	..	..	..	..
Trichinopoly	..	..	..	..	..	33	..	..	..	..	..	..	..	..	..	..	..
Tinnevely	..	..	..	..	..	39	..	..	..	..	..	..	..	..	..	..	..
Vizagapatam	..	..	..	..	..	18	..	..	..	..	..	..	..	..	..	..	..
Total for the year 1889	101	69	159	79	545	21	8	1	1	1	1	2	1	1	1	1	1
" " 1888	91	51	133	73	446	20	4	..	..	..	..	..	..	..	..	..	..

Human Cases—Class A.

Including cases in which viscera or evacuations were examined, with or without suspected substances, food, &c.—cont.

District received from.	Poisons—cont.													
	Organic.													
	Aconite and Gloriosa Superba.	Picrotoxin.	Opium and Oleander.	Cerbera Odallam.	Aconite and Opium.	Abrus Precatorius.	Calotropis Gigantea.	Ganjah, Aconite and Gloriosa Superba.	Aconite.	Opium.	Datura.	Plumbagin.	(Duva.)	Datura and Ganjah.
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	1	1	1	1	1	1	1	1	1	1	1	1	1	1
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1	1	1	1	1	1
25	1	1	1	1	1	1	1	1	1	1	1	1	1	1
26	1	1	1	1	1	1	1	1	1	1	1	1	1	1
27	1	1	1	1	1	1	1	1	1	1	1	1	1	1
28	1	1	1	1	1	1	1	1	1	1	1	1	1	1
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1
32	1	1	1	1	1	1	1	1	1	1	1	1	1	1
33	1	1	1	1	1	1	1	1	1	1	1	1	1	1
34	1	1	1	1	1	1	1	1	1	1	1	1	1	1
35	1	1	1	1	1	1	1	1	1	1	1	1	1	1
36	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total for the year 1889	1	1	1	1	1	1	1	1	1	1	1	1	1	1
" " 1888	1	1	1	1	1	1	1	1	1	1	1	1	1	1

TABLE III.—Human Cases—Class B.

Including cases in which no viscera or evacuations were received for examination, but only suspected substances, food, &c.

Districts received from.	Number of cases.	Number of cases in which poison was detected.	Number of analyses.	Poisons.									
				Inorganic.				Organic.					
				Arsenious Oxide.	Mercuric Salt.	Opium.	Arsenious Oxide and Lead Sulphide.	Red Oxide of Mercury.	Strychnine.	Calotropis Gigantea.	Ganjah.	Nux Vomica and Abrus Precatorius.	Opium.
Anantapur ..	2	2	2	1	1	1	1	1	1	1	1	1	1
Arcot, North	5	2	10	1	1	1	1	1	1	1	1	1	1
Arcot, South	3	1	9	1	1	1	1	1	1	1	1	1	1
Bellary ..	2	2	6	1	1	1	1	1	1	1	1	1	1
Canara, South	2	1	1	1	1	1	1	1	1	1	1	1	1
Coimbatore	1	1	2	1	1	1	1	1	1	1	1	1	1
Cuddapah ..	2	2	3	1	1	1	1	1	1	1	1	1	1
Ganjam ..	2	1	2	1	1	1	1	1	1	1	1	1	1
Godavari ..	1	1	3	1	1	1	1	1	1	1	1	1	1
Kistna ..	1	1	1	1	1	1	1	1	1	1	1	1	1
Kurnool ..	4	3	8	3	1	1	1	1	1	1	1	1	1
Madura ..	4	3	6	2	1	1	1	1	1	1	1	1	1
Nellore ..	1	1	1	1	1	1	1	1	1	1	1	1	1
Salem ..	2	2	2	1	1	1	1	1	1	1	1	1	1
Trichinopoly	1	1	1	1	1	1	1	1	1	1	1	1	1
Tinnevely ..	2	2	4	2	1	1	1	1	1	1	1	1	1
Total for 1889 ..	35	21	62	9	2	2	1	1	1	2	2	1	1
" " 1888 ..	36	22	74	8	1	1	1	1	1	1	1	2	2

6. The balance of 46 cases of alleged poisoning in which the chemical examination did not result in the discovery of any poison may be primarily divided into two groups, viz:—

Group I—consisting of twenty cases in which only symptoms (such as nausea or vomiting) occurred under circumstances which aroused suspicion, but without a fatal result; and

Group II—of twenty-six cases in which a fatal occurrence was reported to have occurred under suspicious circumstances.

Group I.—In many of these cases the nature of the articles sent preclude the possibility of more than a partial examination being carried out, e.g., the search for a vegetable poison in three or four large chatties containing earth picked up from the floor of a house or from a dust-pit in the backyard and labelled "Vomited matter," "Remainder of food," &c., is a hopeless task and has often to be abandoned for more useful work. Frequently, again, only articles having some indirect and often uncertain connection with the case are forwarded, and when discovered to be non-poisonous are not credited as detections, although their identification may have involved an extended examination. An instance of *varagu poisoning* reported from Tindivanam, fortunately without fatal consequences, may be noted here. Thirty-one persons, after eating new grain purchased in the local bazaar, were attacked "with vomiting followed by giddiness and inability to stand upright, their eyes were jaundiced, they could not recognise bystanders and they became semi-comatose for three days. The vomiting in some cases was so severe that no nourishment could be given by the mouth for two days. Nine of them also had fever after the third day." Poisoning as a result of eating this grain is occasionally met with in India in the same way that darnel poisoning occurs from eating bread made of flour in which accidental intermixture of the seeds of this grass with wheat has occurred; the symptoms of varagu poisoning also resemble those of darnel poisoning, so much so that it has been suggested that varagu poisoning is really poisoning by darnel which has been accidentally introduced. In the present case a most careful search was made for foreign grain, and the samples sent were examined chemically and microscopically without discovering any difference between them and locally purchased grain; samples were also sent to Dr. Thurston, who reported to the same effect. The precise nature of the poison in darnel and in varagu is unknown. It is believed that the varagu grain raised at the proper season is wholesome, while that raised on the same ground as a second crop and that raised on wet marshy ground are unwholesome, and it is also said that only the new grain exhibits poisonous properties; but these statements do not appear to be based upon reliable observations. The possibility of the grain being diseased has also been suggested, and Dr. Bonavia of Bengal "thinks after rain falls and the ear is ripening, a fungus attacks it and

it is this which is to blame, and that washing the grain previous to cooking it renders it harmless." Various cereals are liable to become poisonous when attacked by fungus, and outbreaks of ergotism arising from the use of the affected grain as food are well known; a disease appears in cumbu in which the affected grain is said to resemble ergot of rye, but I have not been able to discover any instances in which cumbu has proved poisonous, nor does there seem to be any authentic discovery of disease in varagu to account for its occasional poisonous behaviour. The poisonous grain does not appear to be the product of a variety but of the plant which yields the healthy grain. An instance of poisoning by eating cholam grain, apparently diseased, recently occurred in the Anantapur district, but the examination of the grain has not yet been completed.

Group II.—In this group of twenty-six cases, there were reported to be twenty-seven deaths, and from the information furnished regarding them, the notes of *post-mortem* examinations, and medical officer's certificates, &c., they are divisible into three sub-groups:—

- (a) Cases in which the evidence of death being due to disease or injury preponderates over the evidence in favor of the suspicion which necessitated chemical investigation:—

	Deaths.
Cholera	4
Hæmorrhage and septicæmia following abortion, and other accidents of pregnancy	6
Suicidal hanging	1
Paralysis, phthisis, &c.	5
Total	16

- (b) Cases in which, while there is insufficient or no evidence in favor of a disease cause, there is also little or no evidence in favor of the death having resulted from the administration of a poison. In six cases the sole ground for suspicion rested on the fact that death was sudden; the majority of these died after suffering from symptoms resembling those of cholera, one probably from infantile convulsions, and another during a drinking bout. The seventh case was that of a man who died without recovering consciousness after admission into hospital; at the *post-mortem* examination the evidence of death being due to "an old clot in the basilar artery of the brain" was considered insufficient, and the viscera were forwarded for chemical examination. In the eighth case it was reported that a man went out after supper to watch his straw heap in the field and was found dead there next morning. He was the husband of three wives, and to clear up suspicion which fell on the youngest wife, the local medical officer made a *post-mortem* examination and certified that death was caused by "coma, the result of sudden shock due to a severe fright," corroborating in a way the verdict of the panchayat, who recorded that the man was "struck dead by a devil because he went alone at night after having sexual intercourse with his wife." After the burial of the corpse the two older wives produced further evidence against the youngest wife, her father and three others, and consequently exhumation was ordered with the view of sending the viscera for chemical examination. In the meantime the grave had been disturbed (by animals?), no viscera could be found, and only some pieces of bone and earth from the grave were obtained and forwarded, in which no poison was detected.

- (c) Cases in which the balance of evidence appears to be in favor of death by poison, but in which no poison was detected:—

- (1) A girl, after eating some root (suspected to be oleander), suffered from nausea and giddiness, became insensible, and died. *Post-mortem* examination revealed intense congestion of stomach and intestinal tract.
- (2) A man, having quarrelled with his wife, swallowed "the juice of some leaves," suffered from vomiting, and died two days after. *Post-mortem* examination afforded no clue to the nature of the poison.
- (3) A man was found dead in the house of a prostitute, and the medical officer certified that the *post-mortem* signs were "not inconsistent with alcoholic poisoning;" the medical officer was unfortunately not made aware of the suspicion of death being due to alcohol till after he had added spirit to the viscera secured for chemical examination.

7. Of the 90 cases in which poison was detected, inorganic poisons were discovered in 49 and organic poisons in the remaining 41. The total number of deaths ascertained to be due to the effects of poison was 53 (including 1 in Class B), of which 39 were homicidal (including six deaths in cases of criminal abortion), 12 were suicidal, and 2 doubtful.

Inorganic Poisons.

8. The more important details of the cases in which poisons of this class were detected are furnished below with the corresponding details for four previous years:—

TABLE IV.

	1889.	1888.	1887.	1886.	1885.
Cases included in Class A	36	31	40	45	34
Class B	13	10	11	13	11
Number of individuals affected in A and B	98	76	90	98	91
" of deaths in A and B	25	21	30	24	22

As usual, the preparations of arsenic alone, or together with some other poison, head the list in the order of frequency.

9. The following cases of *arsenical poisoning* may be briefly noted:—

- (a) A man shortly after eating a meal was seized with vomiting and purging and died. Suspicion of poisoning fell upon his mother, who it was said was instigated by her paramour. The body was exhumed some days after, and five-hundredths of a grain of white arsenic were found in the portions of the body sent; some substance subsequently found in the evacuations contained nineteen grains of white arsenic.
- (b) A woman, who introduced into her husband's food "some medicine in order to regain his affection," failed to secure her object by his very narrowly escaping death; four-fifths of a grain of white arsenic being found in a small portion of the food which was left.
- (c) A case of suicide by arsenic which was admitted into one of the hospitals in Madras is remarkable for the magnitude of the dose which must have been taken, nearly two hundred and sixty-five grains of white arsenic having been extracted from the viscera and vomited matter.
- (d) An attempt to poison a brother was frustrated by the offender being discovered in the act of putting some white powder (two grains and a half of white arsenic) into the drinking-water pot.
- (e) A rich ryot and twenty-three servants of his suffered from severe vomiting and stomach-ache for eighteen hours after eating their mid-day meal. White arsenic was found in the remainder of the food and in the vomited matter sent.
- (f) Two girls went to the river for "poojah," where the Brahmin gave them sugar and plantains; shortly after eating these, they were both seized with the usual symptoms of arsenical poisoning and one of them died in a few hours.
- (g) A man married a second wife, whom he brought home in spite of the remonstrances and threats of the first wife, and the latter poisoned him with arsenic.
- (h) In return for some slight services rendered to a neighbour, a man received a present of sweetmeats, which he shared with his wife and three children; after eating it, they all suffered from vomiting and purging caused by white arsenic, eight grains of which were extracted from the remainder of the sweets.
- (i) A man lost two of his children in one night, and six days after burial the corpses were exhumed, as the father began to suspect foul play. A milkman, who he now learnt was very friendly with his inveterate enemy, was in the habit of gratuitously supplying milk for his children during ten days previous to their death, and a double quantity was supplied on the night on which they took ill after supper. The baby died in two hours, and a lad 4 years old in three hours; the remnant of milk and evacuations were not procurable, but arsenic was found in the exhumed viscera.

10. *Mercurial Compounds* were discovered alone in ten cases and together with arsenious oxide in three cases, of which the following may be briefly mentioned:—

- (a) As an instance of rankling jealousy long after it had been provoked. A woman was discarded by her husband during her pregnancy which he suspected to be the result of infidelity to him; and he was jealous of the child which she gave birth to. In a fit of revenge four years after he contrived to send poisoned plantains to this child and destroyed it.
- (b) As an example of wanton cruelty perpetrated apparently in the absence of provocation, the following could scarcely be surpassed. Some persons forcibly held down a woman, and rubbed some stuff (Perchloride of Mercury) into her mouth and elsewhere. She consequently suffered all the agony of severe mercurial poisoning with sloughing of the mucous passages which came in contact with the poison, the *post-mortem* examination revealing a shocking state of things. The woman died after nine days, but traces of mercury were obtained from the liver and kidney.
- (c) As an example of native medical treatment which is now-a-days not so frequently heard of. A young married woman who was turned away by her husband became pregnant through illicit intercourse, and with the connivance of her paramour procured abortion in the following manner:—"A snake-charmer woman gave her some

medicine (mercurial) and introduced an abortion stick into the womb; she was then placed on her back, held firmly down, and severely trodden on the abdomen. This was repeated at intervals through the day, each operation being preceded by a dose of the medicine; after the third operation she could no more walk about and complained of great pain, and the treatment was discontinued for the night. Next day it was commenced again and continued at intervals till the afternoon, the woman's agonies increasing all the while and ending in the expulsion of the foetus and death of the mother." The *post-mortem* signs (notes of which were most carefully recorded) fully corroborated the above account.

11. *Bangle-glass*.—A woman gave her bangles to a man (who it turned out was at enmity with her husband) on his promising to give her something in return to put into her husband's food which would stimulate his waning affections for her. The husband discovered a piece of glass which stuck on his tongue during a meal, and his wife confessed what she had done. The vomited matter and remainder of food contained a good deal of coarsely-powdered blue glass, such as native bangles are made of.

Organic Poisons.

12. The use of this class of poisons has increased very much during the last two years. During the four years 1884—87, the percentage of organic poisons to total poisons detected ranged in round numbers from 33 to 18 in a declining ratio; in 1888, the percentage rose to 43.8, and in the year under review to 45.6. The following table shows comparatively for five years the more important particulars of the cases in which organic poisons were detected:—

TABLE V.

	1889.	1888.	1887.	1886.	1885.
Cases included in Class A	33	20	9	5	13
Class B	8	12	2	11	6
Number of individuals affected in A and B ..	59	51	20	47	26
Number of deaths in A and B	28	17	9	2	7

13. *Aconite* was detected alone in seven cases, with opium in one case and ganjah in another.

- Four boys were poisoned—two fatally—by stealing toddy from the pots tied to the date tree. The toddy climber had evidently poisoned the toddy in order to deter future robbers.
- A woman after some disagreement with her husband left the house ostensibly to collect firewood. As she did not return in the evening, a search was made and she was found dead in the dry river-bed.
- A priest and his family (seven persons in all) suffered from well-marked symptoms of aconite poisoning an hour after eating food which had been sent by a brother of the same cloth, ending in the death of three of them.
- A man complained of uneasiness in stomach two hours after a meal, followed by other well-known symptoms of aconite poisoning, and died in four hours. His wife had put "some powder" in his curry at the instigation of a more favored companion.

14. *Opium* was detected in four cases and in three others the alkaloid *Morphine* was extracted from the viscera sent. In one of these cases the medical officer had fortunately secured and sent the urine which was found in the bladder during the *post-mortem* examination, for, as it happened, the alkaloid was readily extracted from this article when only doubtful evidence of its presence in the stomach could be obtained. It has been stated that "Meconic acid appears to resist decomposition better than morphia;" but my experience is contrary to this, inasmuch as morphine has been detected in many instances where no evidence of meconic acid was forthcoming. It is not, however, probable that in these cases the more expensive alkaloid in its pure state would have been employed by the poisoner when crude opium is always so readily obtained; and morphine is an alkaloid which resists decomposition well, Stas having found it thirteen months after burial. The constituents of opium are known to undergo partial destruction in the animal body, but a portion appears constantly in the secretions, particularly morphine in the urine, the elimination from a single dose extending over five or six days. In opium poisoning there is some loss of power over the bladder, and at the *post-mortem* the bladder is usually found full of urine; so that the conditions for detection of this alkaloid after death are most favorable. It would therefore be well if medical officers would bear this in mind during *post-mortem* examinations, for it is the exception for them to send urine collected at such examinations and the rule to concentrate attention upon the "stomach and contents," when in all probability the poison has passed through this organ long ago.

15. *Ganjah* was found alone in six cases, with *datura* in one, and in another with *aconite* already referred to.

- Some food declared to have been given to a man with intention to cause his death was found to contain a large amount of ganjah.
- An intemperate civil apothecary appealed to a native quack for something to turn him from his vicious habit, and he died fourteen hours after taking the reputed cure; the remainder of the medicine turned out to be ganjah, evidence of which was also obtained from the stomach and contents.
- A man was seized with vomiting immediately after drinking arrack; ganjah was found in the vomited matter, also in the remainder of the arrack.
- Five persons fell in on a journey with a stranger who cooked the food for their mess, supplied his own wants, and disappeared. The five men soon after their meal "got mad," wandered about the village, and were taken into custody by the police; they suffered from dryness of throat, hoarseness, disordered vision and talked incoherently as if drunk. The vomited matters sent for examination contained ganjah.

16. *Datura* and *Atropine* were found in four cases alone, and mixed with ganjah in one case. In three cases returned under *Datura*, parts of the plant used were also sent and were identified; in the other two cases returned as *Atropine*, a mydriatic alkaloid was isolated:—

- Three chucklers who were in the habit of stealing toddy off the trees became more than usually intoxicated on one occasion, and one of them who drank a larger quantity than the others became insensible and died. *Atropine* was extracted from his stomach and from the toddy, in which were also found *datura* seeds.
- In another a woman committed suicide, owing to a quarrel with her husband, by eating the *datura* fruit; the seeds were found in her stomach, from which also the alkaloid was obtained.
- Four persons became delirious after eating a pudding, and one of them also became insensible and died; from the deceased's stomach *atropine* was extracted.

17. *Calotropis Gigantea* was identified in four cases; in one of them an abortion stick was armed with the juice of this plant, and the remaining three were suicidal cases, in each of which the wife, owing to a quarrel with her husband, drank the juice of this plant, with fatal result in one case. The chief symptoms observed were nausea and faintness.

18. *Strychnine* was detected in four cases—in a child which died in convulsions four hours after taking a "worm powder" prescribed by a native quack; in a Brahmin widow who did not wish to survive the disgrace of her pregnancy; and in the case of a woman who committed suicide because of a quarrel with her husband. In the fourth case, the corpse of a woman was dragged out of a well, and as the cause of death could not be ascertained at the inquest, the body was conveyed to the local dispensary by the police; on getting ready for the *post-mortem* examination, a dead foetus dropped out of the winding sheet to the astonishment of the by-standers, *post-mortem* delivery having occurred on the way unnoticed by the bearers of the corpse. There were no signs indicating that any attempt to cause abortion had been made, there were no signs of drowning, the foetus was seven or eight months old, and its delivery was accompanied by total inversion of the uterus. Under these circumstances, the woman also being a widow, it was suspected that she died from the result of a drug taken to procure abortion and that her paramour had cast the corpse into the well to veil the cause of death. *Strychnine* was found in the viscera sent. The occurrence of childbirth after the life of the mother had become extinct, without the aid of art and indeed even after interment, has been recorded and avouched by many observers of established credit; the independent contractile power of the uterus, or cadaveric rigidity, being stated to be the chief factors in the production of this accident. So-called "Cadaveric spasm" also is known to occur at or after death by strychnine poisoning and to persist till true cadaveric rigidity comes on, disappearing only with it. In the present instance the body must have lain for about eighteen hours in the water, cadaveric rigidity had all but passed away at the time of examination (only the upper limbs being slightly stiff), and, no doubt, expulsion of the foetus occurred by the pressure of the gaseous products of putrefaction which filled the abdomen. The possibility of this accident occurring is a point in obstetric jurisprudence which should not be forgotten when examining the dead body of a female alleged to have miscarried.

19. *Abrus Precatorius*.—Four persons suffered from vomiting and purging after eating ragi porridge into which "some red substance" had been put. The suspected substance sent was identified as the seeds of this plant. Seeds of the white variety were identified mixed with nuxvomica seeds in another case of suspected attempt to poison. This is the well-known "Gundumani" employed for poisoning cattle by "Sui" referred to in last year's report.

20. *Plumbagin* was detected in a corpse found in a well without signs of death by drowning and without any further information to throw light on the circumstances of the death; and in a case of a woman in whom *post-mortem* signs of recent delivery were found, the root of the *Plumbago Zeylanica* being an abortifacient of old reputation.

21. *Oduvan*.—A pregnant widow died from symptoms of gastro-intestinal irritation after taking an abortifacient; from her stomach was extracted a non-alkaloidal poison which gave the reactions similar to those obtained from the extract of this plant (*Lebedieropsis Orbicularis*).

22. Fourteen cases included under other headings referred to the offence of *criminal abortion* and there were twenty-nine instances of *multiple poisoning*, the largest number of individuals affected and of deaths in any single case being respectively 7 and 3. The largest number of persons affected without any death occurring was 24 in an arsenical case.

23. There was only one case in which *the poison extracted could not be identified*. A child four months old died soon after being given some medicine by a quack; a poisonous alkaloid was extracted from the viscera which produced paralysis of voluntary movements and of respiration in the frog. The body was said to have been highly decomposed, but the alkaloidal obtained did not respond to the ordinary tests of a "Ptomaine."

II.—BLOOD STAINS.

24. The usual information regarding these cases is given in the following table:—

TABLE VI.—*Blood Cases.*

Districts received from.	Number of cases.	Number of cases in which blood was detected.	Number of examinations.
Anantapur	1	1	8
Arcoot, North .. .	2	1	7
Arcoot, South .. .	1	..	9
Bellary	5	4	14
Coimbatore .. .	1	1	1
Cuddapah .. .	6	2	10
Kistna	3	2	11
Kurnool	1	1	2
Madura	1	1	1
Salem	2	1	8
Tanjore	2	1	9
Tinnevely	3	3	3
Vizagapatam .. .	1	1	1
Total for the year 1889 ..	29	19	84
" " 1888 ..	26	20	88

Eighteen of the cases in which examinations for blood were conducted were connected with the crime of murder, three with wounds by stabbing, two with rape, one with abortion, and in five cases no particulars were received. Of the nineteen cases in which the presence of blood was established, the stains in seven were discovered to be due to mammalian blood.

The possibility of *distinguishing human blood* in fairly recent stains, containing not very minute quantities of blood, appears to be established by a research recently carried out by Dr. Monckton Copeman, his method depending on the different way in which the hæmoglobin of the blood crystallises in different animals. Hæmoglobin is not crystallisable from normal human blood, but it was known that crystals of it appeared in blood taken from patients suffering from pernicious anemia, and mounted under the microscope. To imitate the condition of the blood in this disease, normal blood was diluted with sheep's serum and mounted, and it was found that when fresh serum was added no crystals appeared, but that they appeared readily if the serum had become decomposed. It was observed that the crystals obtained from human blood by this, and other methods also, always consisted of *reduced hæmoglobin*, while the blood of a large number of other mammals examined crystallised as *oxy-hæmoglobin*, these two varieties of hæmoglobin being readily distinguishable, with the aid of a microspectroscope, by their characteristic absorption bands. So far only one exception has been met with, viz., the blood of the monkey, from which hæmoglobin crystallises as reduced hæmoglobin, but the crystals are fortunately of a different shape from human hæmoglobin.

III.—SPERMATIC STAINS.

TABLE VII.

Districts received from.	Number of cases.	Number of cases in which semen was detected.	Number of examinations.
Kistna	1	..	2
Madura	1	..	1
Total for the year 1889 ..	2	..	3
" " 1888 ..	3	1	15

25. Both the examinations referred to the crime of rape, but said to have been committed under circumstances which made the charges apparently fictitious. Two of the cases in which mammalian blood was discovered (under Blood Stains) also referred to the crime of rape, but no sperms could be detected even in those stains, though in one of these cases the guilt of the accused was established from other evidence. Suspected spermatic stains require much greater care in packing than even blood stains, as the very slightest pressure or friction is sufficient to crush the sperms and to cause the microscopic examination to fail in their detection. As a rule, these stained articles pass through so many hands before reaching this office, that the result of the examination is usually doomed to end in failure.

IV.—CASES OF SUSPECTED CATTLE-POISONING.

26. The following tabular statement exhibits the chief particulars of these cases, arranged as in human cases under Classes A and B:—

TABLE VIII.—*Cattle Cases.*

Districts received from.	Class A.				Class B.					
	Number of cases.	Number of deaths.	Number of cases in which poison was detected.	Number of analyses.	Nature of Poison.				Number of cases in which poison was detected.	Number of analyses.
					Arsenious Oxide.	Calotropis Gigantea.	Mercuric Salt.	Picrotoxin.		
Anantapur ..	6	8	3	21	3	..	..	..	..	..
Arcoot, North ..	..	..	..	..	..	..	..	..	..	..
Bellary ..	1	1	1	4	1	..	..	..	1	..
Coimbatore ..	8	11	7	26	7	..	..	..	3	2
Cuddapah ..	1	1	1	3	1	..	..	..	..	..
Ganjam ..	4	4	2	13	2	..	..	..	3	2
Godavari ..	4	5	3	16	3	..	..	..	2	2
Kistna ..	4	4	2	13	2	..	..	..	3	2
Kurnool ..	2	3	2	6	2	..	..	..	..	..
Madras ..	1	1	..	3	..	..	..	..	..	..
Madura ..	3	3	1	13	1	..	..	..	..	..
Malabar ..	..	..	..	..	..	..	..	..	1	1
Nellore ..	4	4	3	15	2	1	..	..	2	3
Salem ..	..	..	..	..	..	..	..	..	1	1
Tanjore ..	3	5	3	17	3	..	..	..	2	1
Trichinopoly ..	..	..	..	..	..	..	..	..	2	3
Tinnevely ..	1	2	..	2	..	..	..	..	2	1
Vizagapatam ..	..	..	..	..	..	..	..	..	1	1
Bangalore ..	1	1	..	1	..	..	..	..	..	..
Total for 1889 ..	43	53	28	153	27	1	..	..	25	20
" " 1888 ..	38	49	20	110	25	..	2	1	22	16

The number of cases sent up for examination during the year was slightly in excess of those of the two preceding years, the percentage of detections being 70.6, which is the same as last year, though the number of analyses required to be performed was half as many again. The chief instrument of poisoning was, as usual, white arsenic, and there are no cases calling for special remark.

MISCELLANEOUS SECTION.

27. The total number of analyses performed under this heading was 804, of which 34 were for private parties and the rest on behalf of the various Departments of Government, Municipalities, &c.

Much of the work performed in this section, in order to answer questions upon technical matters referred for opinion, &c., cannot be expressed in figures, and is not apparent from the following table:—

EXAMINATIONS made for Government Departments, &c.

Received from	Nature of substance.	Number of examinations.	Total number of examinations for the year.
Board of Revenue	Earth	1	370
	Salt	299	
	Spirits	4	
	Malt liquor	25	
	Dhobies' Earth	39	
	White pills and powder	1	
	Intoxicating drug	1	
Commissariat Department	Rum	6	109
	Nitre	1	
	Malt liquor	87	
	Carbolic powders	8	
	Hay	4	
	Brandy	1	
Chemical Laboratory	Tin	2	19
	Dhobies' Earth	18	
Collector, South Arcot	Rain-water	1	2
	"Droque Amere"	1	
Collector (Sub), Tinnevely	"Elixir"	1	3
	Wine	3	
Collector of Sea Customs	Raspberry Champagne coloring	1	103
	Essence of Cochineal	1	
	Do. of Vanilla	1	
	Do. of Almonds	1	
	Orange Bitters	1	
	Lemon-juice	1	
	Spirit: Ether: Nitros:	1	
	Sulphuric Ether	1	
	Premier Ginger Ale Extract	1	
	Lime-juice Cordial	3	
	Coca wine	1	
	"Greek Indian Remedy"	1	
	"Medicine"	1	
	Spirits	18	
	Beer heading	1	
	Kerosine oil	28	
	Cylinder oil	1	
	Engine oil	1	
	Lubricating oil	2	
	Petroleum, Stockholm	1	
	Methylated Spirits	16	
	Do. Ether	2	
	Chautoucouine	3	
	Dynamite	7	
	Gelatine dynamite	3	
	Blasting gelatine	4	
	Gelignite	1	

Examinations made for Government Departments, &c.—cont.

Received from	Nature of substance.	Number of examinations.	Total number of examinations for the year.
District Medical Officer, Kurnool	Opium	1	1
Do. do. Coimbatore	Suspected drug	1	1
Do. do. Trichinopoly	Arrack	1	3
	Opium	1	
	Bark	1	
Do. do. Rajahmundry	Drugs, including Ganjah	4	5
	Opium	1	
	Spirits	2	
Deputy Magistrate, Salem	Water	3	3
Deputy Surgeon-General, Eastern District, Madras.			
Executive Engineer, Military Works, Fort St. George.	Sand for filter bed	1	1
Executive Engineer, Presidency Division.	Water	5	5
Government of Madras	Quinine Sulphate	1	1
Inspector-General of Ordnance	Coal	4	4
Inspector of Salt and Abkari Revenue, through District Medical Officer, Coimbatore.	Suspected intoxicating drug.	1	1
Jail Department.	Inspector-General of Jails	4	49
	Medical officer, H.M.'s Penitentiary, Madras.	2	
	Do. Coimbatore	1	
	Do. Cholera Camp, Coimbatore.	1	
	Do. Cuddapah	1	
	Do. Bellary	1	
	Do. Cuddalore	1	
	Do. Vellore	1	
	Superintendent, Central Jail, Trichinopoly.	3	
	Superintendent, Central Jail, Coimbatore.	6	
	Superintendent, Central Jail, Cannanore.	3	
	Superintendent, Hill Jail, Párvatipur.	2	
	Superintendent, Central Jail, Trichinopoly.	2	
	Superintendent, Central Jail, Coimbatore.	2	
	Superintendent, Central Jail, Cannanore.	1	
Joint Magistrate, Chingleput	Superintendent, Hill Jail, Párvatipur.	1	
Municipalities.	Medical officer, 9th M.N.I.	1	24
	Do. 22nd do.	1	
	Tanjore	4	
	Dindigul	1	
	Madras	7	
	Cuddapah	7	
	Madura	2	
	Salem	4	
	Nilgiris	2	
	Do.	1	
Ordnance Officer, Arsenal, Madras	Coal-tar	4	5
	Rangoon oil	1	
	Chloral Hydrate	2	
Principal Medical Storekeeper, Madras.	Subnitrate of Bismuth	1	12
	Standard solutions for water analyses.	9	
Principal, Medical College, Madras	Standard solutions for water analyses for Hygiene class.	2	2
Presidency Magistrate, Madras	Opium	1	1

Examinations made for Government Departments, &c.—*cont.*

Received from	Nature of substance.	Number of examinations.	Total number of examinations for the year.
Superintendent of Telegraph Stores, Madras.	Bichromate of potash ..	1	2
Superintendent of Stationery, Madras	Sulphate of copper ..	1	
Do. Central Museum, Madras.	Inks ..	27	27
Do. Gun Carriage Factory, Madras.	Water ..	1	1
	Yellow soap ..	1	
Superintending Engineer, V Circle	Tin ..	1	2
Senior Medical Officer, Station Hospital, Madras.	Water ..	2	2
	Do. ..	1	1
Senior Medical Officer, Station Hospital, Wellington.	Ale ..	1	2
	Tin ..	1	
	Water ..	10	
	Ale ..	6	
	Porter ..	5	
	Asiatic Ale ..	1	
	Sulphate of Quinine ..	1	
	Damaged paper ..	1	
	Blue-black Ink ..	1	
	Saccharometer ..	1	
Private Parties and Firms	Poudrette ..	1	
	Raw Bone Meal ..	1	
	Steamed do. ..	1	
	Bone-meal Manure ..	1	
	Ragi flour ..	1	
	Cocoonut oil ..	1	
	Suspected substance ..	1	
	Kalloy ..	1	34
	Total ..	804	804

28. *Salt*.—Nearly 300 analyses were made for the Board of Revenue, the work being more than enough to keep fully occupied the two Salt Assistants of the establishment sanctioned in 1886.

29. *Dhobies' Earth*.—Forty samples were examined from various districts, chiefly with the view of ascertaining their carbonate of soda value and a cheap method of extracting the soda crystals, in order to establish local factories, if it could be shown that the product was obtainable on a scale which would admit of its competing with the imported article. The result of the experiments did not favor any outlay being incurred for testing the question on a large scale. In this connection it might be mentioned in passing that an inquiry into a proposal from the Assistant Director of Land Records and Agriculture, viz., to manufacture carbonate of soda and ammonium chloride by the "Soda-ammonia" process by utilising the refuse blood of slaughter-houses for this purpose, also ended unfavorably.

30. *Spirits and Malt Liquors*.—These were examined as to their purity and quality generally, the majority being examined for the Commissariat Department chiefly as to their fitness for issue to troops, including eighty-seven samples of malt liquor and seven of spirits; while twenty-five samples of malt liquor and four of spirits were examined for the Revenue Board.

31. *Petroleum and Explosives*.—Thirty-three examinations were conducted under the Petroleum Act and fifteen under the Explosives Act without a single rejection.

32. Some samples of *Coal* were examined in connection with an inquiry into the cause of the fire which occurred lately in Madras in destroying a large quantity of Government coal. The samples examined were found to be highly charged with iron pyrites, supporting in a measure the theory of the spontaneous origin of the fire. The oxidation of the pyrites which goes on by exposure to air is attended with a rise of temperature quite sufficient under favorable circumstances (especially if the heat developed by oxidation is not conducted away) to cause spontaneous combustion of the coal. Ships carrying coal have been known to take fire from this cause; and the burning cliffs of the Dorsetshire coast are caused by the oxidation of pyritiferous shale which abounds in the Kimmeridge clay.

33. *Customs Department*.—A large number of examinations, as usual, was made for this department, chiefly drugs and other articles suspected to contain alcohol, with a view to aid in determining the amount of duty to be levied; also samples of methylated spirit as to whether they were sufficiently spoiled according to the orders of Government. Of sixteen samples of methylated spirit examined, four did not pass, as *pure* wood spirit instead of *crude* had been used in their methylation. The orders of Government on this point do not appear to be widely enough known, for parties in ordering methylated spirit from home apparently do not particularly ask that the spirit should be spoiled with crude wood naphtha. English methylated spirit which, though it contains the prescribed proportion of wood spirit, is not, within the meaning of the orders of this Government, "sufficiently methylated so as to render it unfit for use as a beverage." Indeed, the fact had been for a long time past practically demonstrated by the large sales to the public which chemists and druggists effected of methylated spirit on Sundays, especially in Scotland, on which days public houses are closed. To such an extent was this practice of drinking methylated spirit on Sundays carried that by recent legislation a chemist and druggist is forbidden to sell such spirit between Saturday night and Monday morning except under a penalty of hundred pounds.

34. *Waters*.—The majority of these were examined as to their fitness for drinking, and a few as to their fitness for boiler purposes, viz., twenty-four samples on behalf of Municipalities, seventeen chiefly for the Military Department, forty-five for the Jail Department, and ten for private parties. In addition to these, eighteen examinations of *Rain-water* were made during the year, the general increase of other work preventing these examinations being conducted as frequently as hitherto. The results of these examinations are given in the table below:—

ANALYSES of Madras Rain-water—Monthly Results, 1889.

	January.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Rainfall .. Inches	0.05	2.05	0.01	1.08	5.57	4.36	5.86	7.47	5.08	11.85	43.38
Total combined Nitrogen (as N. H. 3) .. lb. per acre	0.001	0.072	0.007	0.037	0.224	0.369	0.277	0.422	0.313	0.392	2.114
Chlorine (as Na. cl.) .. do.	0.092	3.824	0.018	2.014	19.334	6.890	7.532	8.363	9.188	22.114	69.369
Solids .. do.	0.226	9.275	0.045	4.886	21.989	9.863	17.758	21.943	22.102	39.566	147.553
Ash .. do.	0.113	4.637	0.022	2.443	10.994	4.931	8.076	10.971	11.051	19.783	73.021

Recent researches have shown that plants and soils can absorb nitrogen directly from the atmosphere, and determinations of the quantity of nitrogen as nitrates in rain-water are useful chiefly as evidence of the magnitude of electrical discharges in particular places and at particular seasons, than as an index of the direct fertilising effect of rain. The composition of rain-water is of importance from other points of view as well, and these analyses will be continued regularly till sufficient data are collected for basing any conclusions upon them.

35. In conclusion, I beg to be allowed to bring to the notice of Government the continual disregard of the orders regarding judgments. In paragraph 3 of G.O., No. 1478, Public, dated 29th June 1885, Government directed that "copies of judgments in all cases referred to the Chemical Examiner" should be forwarded to him, and the special attention of Magistrates was again drawn to the subject in paragraph 10 (a) of G.O., No. 535, Public, dated 19th May 1888. Sub-Magistrates sometimes say in reply to my enquiries that "no judgment was passed, the case having been struck off, consequently no copy of judgment was sent;" others, again, say that the case was committed to the District Judge, to whom application should be made; and a Superintendent of Police replied that the orders of Government on the subject referred only to District Magistrates. About forty reminders regarding judgments were sent out by me in September last, and up to date replies of some sort have been received from about half of this number. The medico-legal records in the Chemical Examiner's office would be doubled in value if results of trials and judgments could be obtained for the cases investigated. I have introduced into this report an attempt to classify as far as possible the medico-legal work of the year, but the usefulness of such classification is limited by the want of information as to the actual results of the legal trial in many cases. I therefore beg that Government may be pleased once more to direct more strict attention to the orders upon this subject.

36. The Assistant Chemical Examiner, the two Salt Assistants and the other members of the laboratory establishment, have continued to render efficient aid, and have worked zealously throughout a busy year. The service books of the establishment are up to date.

37. A general statement, including the figures given in the previous tables, is, as usual, given below:—

Nature of work.	Poisons.																			
	Inorganic.																			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	Total number of cases.	Total number of articles received for examination.	Total number of cases in which poison was detected.	Total number of cases in which blood was detected.	Total number of cases in which semen was detected.	Arsenious Oxide.	Arsenious Oxide and Iocalgar.	Arsenious Oxide, Hydronehoric Acid and Sulphuric Acid.	Arsenious Oxide and Mercuric Salt.	Arsenious Oxide and Cinnabar.	Arsenious Oxide and Antimony.	Arsenious Oxide, Iocalgar and Strychnine.	Arsenious Oxide and Lead Sulphide.	Arsenious Oxide and Orpiment.	Mercuric Salt.	Orpiment.	Copper Sulphate.	Red Oxide of Mercury.	Bangle-glass Powder.	
Human cases {	101	545	69	..	..	21	1	1	3	..	..	..	..	..	8	1	..	..	1	
" B	35	62	21	..	..	9	..	..	..	..	..	..	..	..	2	2	..	..	..	
Blood stains	29	84	..	19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Seminal stains	2	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Cattle cases {	43	153	28	..	..	27	..	..	..	..	..	..	..	..	..	..	..	..	..	
" B	25	38	20	..	..	18	..	..	..	..	..	..	..	..	..	..	..	..	..	
Examinations for Government Departments.	770	770	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
For private firms, &c.	34	34	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Total for the year 1889	1,039	1,689	138	19	..	75	1	1	3	..	..	..	..	..	10	3	..	..	1	
" " 1888	870	1,416	118	20	1	68	1	1	2	1	..	..	1	1	6	..	1	1	..	

Tabular Statement for the year—cont.

Nature of work.		Organic.																					
		21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
		Aconite.	Aconite and Gloriosa Superba.	Aconite and Opium.	Aconite, Ganjah and Gloriosa Superba.	Abrus Precatorius.	Atropine.	Asafoetida.	Calotropis Gigantea.	Corbora Odallam.	Datura.	Datura and Ganjah.	Ganjah.	Ganjah and Opium.	Lebodieropsis Orbicularis "Odavan."	Morphia.	Nux Vomica and Abrus Precatorius.	Opium.	Opium and Oleander.	Picrotoxine.	Plumbagin.	Strychnine.	Unidentified Poison.
Human cases	Class A	7	..	1	1	1	1	..	2	..	2	1	4	..	1	3	..	3	..	..	2	3	1
	" B	..	..	..	..	..	1	..	2	..	..	..	2	..	..	..	1	1	..	..	..	1	..
Blood stains	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Seminal stains	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cattle cases	Class A	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..
	" B	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Examinations for Government Departments.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
For private firms, &c.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total for the year 1889 ..		7	..	1	1	1	2	..	5	..	2	1	7	..	1	3	1	4	..	..	2	4	1
" " 1888 ..		5	1	..	..	..	3	1	2	1	..	1	5	1	1	..	..	5	1	2	3	..	3

Govt. of {1890} Madras.
PUBLIC.

Issued

Recd.

Encl.

G.O., &c., 14th May 1890,
Nos. 359, 360.

MAY.

27.

Chemical Examiner's Report.

Reviewing the — for 1889 and forwarding
copy of Proceedings to the Government of India

From M 2217

The Chemical Examiner
Madras

To

The Chief Secretary to
Government of Madras
Public Department

2. 6. 1890 25/14.5.30

No: 226

Date 25th March 1890.
Received. }

Enclosure

Subject.

Submitting the Annual report
of the Chemical Examiner's
Department for the year 1889

I have the honor to be

Nature of Work.		Total number of cases.	Total number articles received for examination.	Total number of cases in which poison was detected.	Total number of cases in which blood was detected.	Total number of cases in which arsenic was detected.	Arsenious oxide
Human cases	Class A—	101	545	69	"	"	21
	— " — B —	35	62	21	"	"	9
Blood stains—		29	84	"	19	"	"
Seminal stains—		2	3	"	"	"	"
Cattle cases	Class A—	43	153	28	"	"	27
	— " — B —	25	38	20	"	"	18
Examinations for Government departments—		770	770	"	"	"	"
For private firms &c.—		34	34	"	"	"	"
Total for the year 1889—		1039	1689	138	19	"	75
— " — 1888—		870	1416	118	20	1	68
20		4	4	"	"	"	"

Sir

Your most Obedient Servant

W. A. R. M. M. M. B., C. H., F. C. S., F. I. C.

Acting Chemical Examiner

Poisons

Inorganic

Organic

[illegible]

by the want of information as to the actual results of the legal trial in many cases. I therefore beg that Government may be pleased once more to direct more strict attention to the orders upon this subject.

36. The assistant Chemical Examiner, the two salt assistants and the other members of the laboratory establishment have continued to render efficient aid, and have worked zealously throughout a busy year. The service books of the Establishment ~~and~~ are up to date.

37. A general Statement, including the figures given in the previous tables, is as usual given below:-

to the subject in 1888. Sub-Magistrates some-
times say in reply to my enquiries that 'no
' judgment was passed, the case having been
' struck off, consequently no copy of judgment was
' sent, others again say that the case was committed
to the District Judge to whom application should
be made, and a Superintendent of Police replied
that the Orders of Government on the subject re-
ferred only to District Magistrates. About forty
reminders regarding judgments were sent out by me
in September last and up to date replies of some
sort have been received from about half of this
number. The medico-legal records in the Chemical
Examiner's office would be doubled in value if
results of trials and judgments could be obtained
for the cases investigated. I have introduced
into this report an attempt to classify as far as
possible the medico-legal work of the year
but

~~and also in the atmosphere~~
atmosphere, and determinations of the quantity of
nitrogen as nitrates in Rain water are useful chiefly
as evidence of the magnitude of electrical discharges
in particular places and at particular seasons
than as an index of the direct fertilizing effect of
Rain. The composition of Rain water is of importance
from other points of view as well and these analyses
will be continued regularly till sufficient data
are collected for basing any conclusions upon
them.

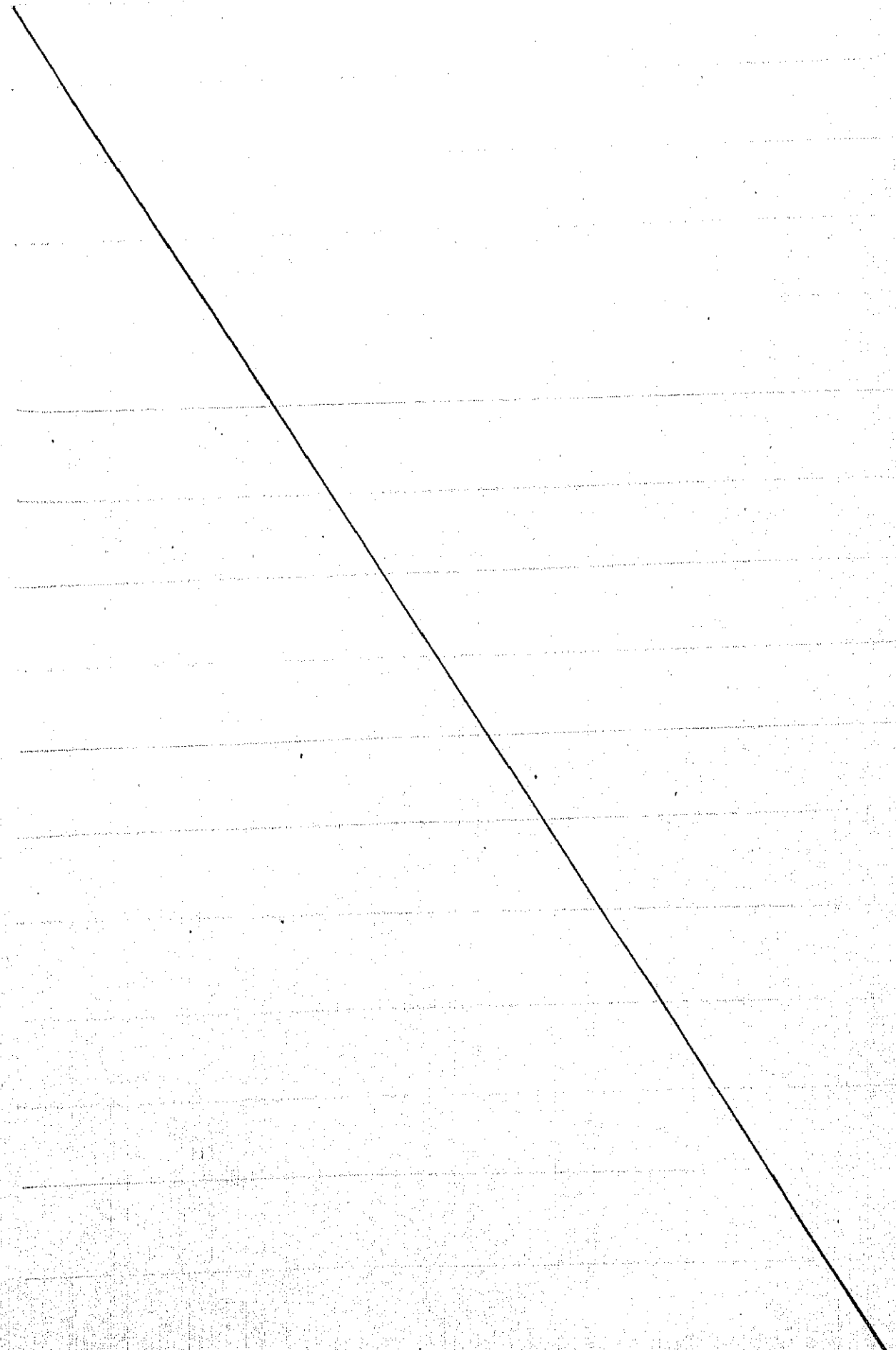
35 In conclusion I beg to be allowed to
bring to the notice of Government the continual
disregard of the orders regarding judgments. In
paragraph 3 of G. O. N^o 1478 Public dated
29 June 1885 Government directed that "copies of
judgments in all cases referred to the Chemical
Examiner" should be forwarded to him, and to
specify

Analysis of Madras Rain-water — Monthly Results 1889

	January	April	May	June	July	August	September	October	November	December	Total
Rainfall — inches —	0.05	2.05	0.01	1.08	5.57	4.36	5.86	7.47	5.08	11.85	43.35
Total condensed Nitrogen } (as NH ₃) ————— the per cent	0.001	0.072	0.007	0.037	0.224	0.369	0.277	0.422	0.313	0.392	2.114
Ammonia (as N) ————— do —	0.092	3.824	0.018	2.014	9.334	6.890	7.532	8.363	9.188	22.114	69.369
Sulphate ————— do —	0.226	9.275	0.045	4.886	21.989	9.863	17.758	21.943	22.102	39.566	147.653
Acid ————— do —	0.113	4.637	0.022	2.443	10.994	4.931	8.076	10.971	11.051	19.783	73.02

518 49

were made during the year. the general increase of
other work preventing these examinations being
conducted as frequently as hitherto. The results
of these Examinations are given in the table below:-



48
50 8/10

of Good Spirit is not within the meaning of the
orders of this Government "sufficiently methylated
so as to render it unfit for use as a beverage." Indeed
the fact had been for a long time past practically
demonstrated by the large sales to the public which
Chemists and Druggists effected of methylated spirit
on Sundays especially in Scotland - on which days
public houses are closed. To such an extent was
this practice of drinking methylated spirit on Sundays
carried that by recent legislation a Chemist and
Druggist is forbidden to sell such spirit between
Saturday night and Monday morning except under
a penalty of hundred pounds.

344 Waters. - The majority of these were examined
as to their fitness for drinking, and a few as to their
fitness for boiler purposes viz: twentyfour samples
on behalf of Municipalities; Seventeen chiefly for
the military department, fortyfive for the jail
department, and ten for private parties. In
addition to these eighteen examinations of Rain water

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Spontaneous combustion of the coal. Ships carrying coal have been known to take fire from this cause; and the burning cliffs of the Dorsetshire coast are caused by the oxidation of pyritiferous shale which abounds in the Kimmeridge clay.

33. Customs Department.—A large number of Examinations as usual was made for this Department chiefly drugs and other articles suspected to contain alcohol with a view to aid in determining the amount of duty to be levied; also samples of methylated spirit as to whether they were sufficiently spoiled according to the orders of Government. Of sixteen samples of methylated spirit examined, four did not pass as pure wood spirit instead of Crude had been used in their methylation. The orders of Government on this point do not appear to be widely enough known, for parties in ^{ordinary} ~~ordinary~~ methylated spirit from home apparently do not particularly ask that the spirit should be spoiled with Crude wood Naphtha. English methylated spirit which though it contains the prescribed proportion of

486/ 46

as to their purity and quality generally - the majority being examined for the Commissariat Department chiefly as to their fitness for issue to troops, including Eightyseven samples of Malt-liquor and seven of Spirits; while twentyfive samples of Malt-liquor and four of Spirits were examined for the Revenue Board.

31. Petroleum and Explosives - thirtythree examinations were conducted under the Petroleum Act and fifteen under the Explosives Act without a single rejection.

32. Some samples of Coal were examined in connection with an enquiry into the cause of the fire which occurred lately in Madras destroying a large quantity of Government Coal. The samples examined were found to be highly charged with Iron Pyrites, supporting in a measure the theory of the spontaneous origin of the fire. The oxidation of the Pyrites which goes on by exposure to air is attended with a rise of temperature, quite sufficient under favorable circumstances, (especially if the heat developed by oxidation is not conducted away) to cause spontaneous

479 45

28. Salt.- Nearly 300 analyses were made for the Board of Revenue, the work being more than enough to keep fully occupied the two Salt assistants of the establishment sanctioned in 1886.

29. Dhobies' Earth.- Forty samples were examined from various districts chiefly with the view of ascertaining their Carbonate of Soda value and a cheap method of extracting the Soda crystals, in order to establish local factories if it could be shown that the product was obtainable on a scale which would admit of its competing with the imported article. The result of the experiments did not favor any outlay being incurred for testing the question on a large scale. In this connection it might be mentioned in passing that an enquiry into a proposal from the assistant Director of Land Records and Agriculture viz: to manufacture ~~the~~ Carbonate of Soda and ammonium Chloride by the "Soda-ammonia" process by utilising the refuse blood of slaughter houses for this purpose, also ended unfavorably.

30. Spirits and Malt Liquors.- These were examined

Examinations made for Government Department 46 44

Received from	Nature of Substance	No. of Examinations	No. of Examinations for the year
Principal Medical College Madras	Standard Solutions for water analyses for Hygiene class	2	2
Presidency Magistrate, Madras	Opium	1	
Superintendent, Telegraph Stores, Madras	Bichromate of Potash	1	
Superintendent of Stationery, Madras	Sulphate of Copper	1	
Central Museum, Madras	Ink	27	2
Central Museum, Madras	Water	1	
Gunpowder Factory Madras	Yellow Soap	1	
Superintendent, Engg. 5 Circle	Sin	1	
Senior Medical Officer, St. Hospital Madras	Water	2	
Wellington	Water	1	
	etc	1	
	Sin	1	
	Water	10	
	etc	6	
	Pork	5	
	etc etc etc	1	
	Sulphate of Quinine	1	
	Damaged paper	1	
	Blue Black Ink	1	
Private Parties and Firms	Saccharometer	1	
	Poudrette	1	
	Raw Bone Meal	1	
	Steamed Bone Meal	1	
	Bone Meal, Manure	1	
	Raffi Flour	1	
	Coconut oil	1	
	Suspected Substance	1	
	Kalloy	1	34
Total		804	34

Examinations made for Government Departments &c.

Received from		Nature of Substance	No. of Examina- tions	Total No. of Examina- tions for the year
Jail Department	Inspector of l. of jails	Water (Coimbatore)	4	
	"	" (Trichy)	2	
	"	Raffi Flour (Trichy)	1	
	"	Cholera Mucal (Trichy)	1	
	Md. O. H. M's Penitentiary Madras	Water	3	
	Medical Officer, Coimbatore	Water	6	
	" Chelva Camp, Coimbatore	Water	3	
	" Cuddalore	Water	2	
	" Bellary	Water	2	
	" Cuddalore	Water	1	
	" Vellore	Water	6	
	Supdt. Central Jail, Trichy	Water	7	
	" Coimbatore	Water	8	
	" Cannanore	Water	1	
	Supdt. Hill Jail, Ponnalpur	Raffi	1	
	"	Cholera	1	49
Joint Magistrate Chingleput		Suspected Intoxicant Gangah.	2	2
Med. Officer of S. S. S.		Water	1	1
" 22 nd B. S. S.		Water	4	4
Municipalities	Tanjore	Water	1	
	Dividigul	Water	7	
	Madras	Water	7	
	Cuddalore	Water	2	
	Madura	Water	4	
	Tolam	Water	2	
Kilgour's		Water	1	24
Ordnance Officer Arsenal, Madras		Coal Tar	4	
		Rangoon oil	1	5
Principal Medl. Storekeeper, Madras		Chloral Hydrate	2	
		Subnitrate of Bismuth	1	
		Standard Solutions for Water Analyses	9	12

Examinations made for Government Department &c

Received from	Nature of Substance	No. of examinations	No. of substances examined the year
Collector of Sea Customs Canton	"Medicine"	1	
	Spirits	18	
	Beer Heading	1	
	Kerosine oil	28	
	Cylinder oil	1	
	Eucalypt oil	1	
	Lubricating oil	2	
	Petroleum Stockholm	1	
	Methylated Spirits	16	
	Methylated Ether	2	
District Medical Officer Kuvempu Coimbatore	Caoutchoucine	3	
	Dynamite	7	
	Gelatine dynamite	3	
	Blasting Gelatine	4	
	Gelignite	1	10
" " " " " " " "	Opium	1	1
	Suspected Drug	1	1
	ettralk	1	
" " " " " " " "	Opium	1	
	Bark	1	3
	Drugs including Ganjah	4	
" " " " " " " "	Opium	1	5
	Spirits	2	2
Dep. Magistrate Salem	Water	3	3
Dep. Surgeon-General, Eastern Dist. Madras	Sand for filter Bed	1	1
Ex. Engineer, Military Works Fort St. George	Water	5	5
" " " " " " " "	Quinine Sulphate	1	1
Inspector General of Ordnance	Coal	4	4
Suspect of Salt & Chikani Revenue through St. Muel. off. Coimbatore	Suspected Intoxicating Drug	1	1

Examinations made for Government Department &c

Received from	Nature of Substance	Number of examinations	Total No. of examinations for the year
Board of Revenue	Earth	1	
	Salt	299	
	Spirits	4	
	Malt Liquor	15	
	Dhobies' Earth	39	
	White pills and powder	1	
	Intoxicating drug	1	370
Commissioner at Department	Rum	6	
	Nitre	1	
	Malt Liquor	87	
	Carbolic powder	8	
	Hay	4	
	Brandy	1	
	Tin	2	109
Chemical Laboratory	Dhobies' Earth	1	
	Rain water	18	19
Collector, South Street	"Droguet Amere"	1	
	"Elixir"	1	2
Collector (Sub) Tennovalley	Wine	3	3
	Raspberries Champagne	1	
Collector of Sea Customs	Essence of cochineal	1	
	"Vanilla"	1	
	"Almonds"	1	
	Orange Bitters	1	
	Lemon juice	1	
	Spirit; Ether; Nitro	1	
	Sulphuric Ether	1	
	Premier fuge's ether	1	
	Lime juice Cordial	3	
	Coca Wine	1	
	"Great Indian Remedy"	1	

425/40

The number of cases sent up for examination during the year was slightly in excess of those of the two preceding years, the percentage of detections being 70.6, which is the same as last year, though the number of analyses required to be performed were half as many again. The Chief instrument of poisoning was as usual, white arsenic and there are no cases calling for special remark.

MISCELLANEOUS SECTION) *10/10*

27 The total number of analyses performed under this heading was 804, of which 34 were for private parties and the rest on behalf of the various departments of Government, Municipalities &c.

Much of the work performed in this section, in order to answer questions upon technical matters referred for opinion &c, cannot be expressed in figures and is not apparent from the following table:-

Table VIII.
Cattle Cases) etc

41

39

Districts received from	Class A.								Class B.					
	Number of Cases	Number of Deaths	Number of Cases in which poison was detected	Number of Analyses	Nature of Poison				Number of Cases	Number of Cases in which poison was detected	Number of Analyses	Nature of Poison		
					Stramonio Oxide	Calabropio Gyanika	elluronic Salt	Picrotoxin				Stramonio Oxide	Stramonio Oxide and opium	Gangjah
Anantapur	6	8	3	21	3	"	"	"	"	"	"	"	"	"
Arcoth, North	"	"	"	"	"	"	"	"	2	2	8	1	1	"
Bellary	1	1	1	4	1	"	"	"	1	"	1	"	"	"
Coimbatore	8	11	7	26	7	"	"	"	3	2	3	2	"	"
Cuddapah	1	1	1	3	1	"	"	"	"	"	"	"	"	"
Ganjann	4	4	2	13	2	"	"	"	3	2	6	2	"	"
Godavari	4	5	3	16	3	"	"	"	2	2	2	2	"	"
Kistna	4	4	2	13	2	"	"	"	3	2	3	2	"	"
Kurnool	2	3	2	6	2	"	"	"	"	"	"	"	"	"
Magrao	1	1	"	3	"	"	"	"	"	"	"	"	"	"
Madura	3	3	1	13	1	"	"	"	"	"	"	"	"	"
Malabar	"	"	"	"	"	"	"	"	1	1	1	1	"	"
Nellore	4	4	3	15	2	1	"	"	2	2	3	2	"	"
Salem	"	"	"	"	"	"	"	"	1	1	1	1	"	"
Tanjore	3	5	3	17	3	"	"	"	2	1	4	1	"	"
Tiruchinopoly	"	"	"	"	"	"	"	"	2	2	3	2	"	"
Tinnevely	1	2	"	2	"	"	"	"	2	2	2	1	"	1
Wizagapatam	"	"	"	"	"	"	"	"	1	1	1	1	"	"
Bangalore	1	1	"	1	"	"	"	"	"	"	"	"	"	"
Total for 1889	43	53	28	153	27	1	"	"	25	20	38	18	1	1
" 1888	38	49	29	116	25	"	2	1	22	16	23	15	1	"

the Spermatozoa and to cause the microscope examination to fail in their detection. As a rule these stained articles pass through so many hands before reaching this office that the result of the examination is usually doomed to end in failure.

Sec. IV. Cases of Suspected cattle-poisoning

2b. The following tabular statement exhibits the chief particulars of these cases arranged as in Human Cases under classes A and B.

Table VII

398p 37

Districts received from	Number of Cases	Number of Cases in which Semen was detected	Number of examinations
Kistna	1	"	2
Madura	1	"	1
total for the year 1889	2	"	3
" " " " 1888	3	1	15

25. Both the examinations referred to the crime of rape, but said to have been committed under circumstances which made the charges apparently fictitious. Two of the cases in which mammalian blood was discovered (under Blood Stains) also referred to the crime of rape but no Spermatozoa could be detected even in those stains, though in one of these cases the guilt of the accused was established from other evidence. Suspected Spermatic Stains require much greater care in packing than even Blood Stains, as the very slightest pressure or friction is sufficient to crush the

blood was diluted with Sheep's serum and mounted,
and it was found that when fresh serum was added
no crystals appeared but that they appeared readily
if the serum had become decomposed. It was
observed that the crystals obtained from human
blood by this, and other methods also, always consisted
of reduced Haemoglobin, ^{while} ~~which~~ the blood of a large
number of other mammals examined crystallised
as Oxy Haemoglobin - these two varieties of Haemoglobin being
readily distinguishable, with the aid of a microspectroscope,
by their characteristic absorption bands. So far only one
exception has been met with viz: the blood of the
monkey, from which Haemoglobin crystallises as reduced
Haemoglobin but the crystals are fortunately of a different
shape from human Haemoglobin.

III Spermatic skins) s.c.

Eighteen of the cases in which examinations for Blood were conducted were connected with the crime of murder, three with wounds by stabbing, two with Rape, one with abortion and in five cases no particulars were received. Of the nineteen cases in which the presence of Blood was established the stains in seven were discovered to be due to mammalian Blood.

The possibility of distinguishing human blood in fairly recent stains, containing not very minute quantities of blood, appears to be established by a research recently carried out by Dr. Brinkton Copeman, his method depending on the different way in which the Haemoglobin of the blood crystallises in different animals. Haemoglobin is not crystallisable from normal human blood, but it was known that crystals of it appeared in blood taken from patients suffering from pernicious anaemia, and mounted under the microscope. To imitate the condition of the blood in this disease normal blood

Table VI. 368p 34
Blood Cases) *idul*

Districts received from	Number of Cases	Number of Cases in which blood was detected	Number of Examina- tions
Anantapur	1	1	8
Arcoth, North	2	1	7
Arcoth, South	1	.	9
Bellary	5	4	14
Coimbatore	1	1	1
Cuddapah	6	2	10
Kistna	3	2	11
Kurnool	1	1	2
Madura	1	1	1
Salem	2	1	8
Tanjore	2	1	9
Tinnevely	3	3	3
Vizagapatam	1	1	1
Total for the year 1889—	29	19	84
— " — 1888	26	20	88

the largest number of individuals affected and of deaths in any single case being respectively 7 and 3. The largest number of persons affected without any death occurring was 24 in an Arsenical case.

23. There was only one case in which the poison extracted could not be identified. - A child four months old died soon after being given some medicine by a quack; a poisonous alkaloid was extracted from the viscera which produced paralysis of voluntary movements and of Respiration in the frog. The body was said to have been highly decomposed but the alkaloid obtained did not respond to the ordinary tests of a "Potomaine".

24. II. Blood Stains s.c.

The usual information regarding these cases is given in the following table:-

32

Nux Vomica Sudo in another case of suspected attempt to poison. This is the well known "Gundamani" employed for poisoning Cattle by "Sui" referred to in last year's Report.

20. *Plumbagin*.— was detected in a corpse found in a well without signs of death by drowning and without any further information to throw light on the circumstances of the death; and in a case of a woman in whom Post mortem signs of recent delivery were found, the root of the *Plumbago zeylanica* being an abortifacient of old reputation.

21. *Oduvan*.— A pregnant widow died from symptoms of gastro-intestinal irritation after taking an abortifacient; from her Stomach was extracted a non-alkaloidal poison which gave the reactions similar to those obtained from the extract of this plant (*Lebedioropsis orbicularis*).

22. Fourteen cases included under other headings referred to the offence of Criminal Abortion and there were twenty nine instances of Multiple poisoning the

interview has been recorded and avouched by many observers of established credit; the independent contractile power of the uterus, or Cadaveric rigidity, being stated to be the chief factors in the production of this accident. So called "Cadaveric Spasm" also is known to occur at or after death by Strychnine poisoning, and to persist till true Cadaveric rigidity comes on disappearing only with it. In the present instance the body must have lain for about eighteen hours in the water, Cadaveric rigidity had all but passed away at the time of Examination, (only the upper limbs being slightly stiff) and no doubt expulsion of the fetus occurred by the pressure of the gaseous ~~products~~ products of putrefaction which filled the abdomen. The possibility of this accident occurring is a point in obstetric jurisprudence which should not be forgotten when examining the dead body of a female alleged to have miscarried).

19. *Aerius Precatorius* - Four persons suffered from vomiting and purging after eating ruggi porridge into which "some red substance" had been put. The suspected substance sent was identified as the seeds of this plant. Seeds of the white variety were identified mixed with

brahmin widow who did not wish to survive the disgrace of
 her pregnancy; and in the case of a woman who committed
 suicide because of a quarrel with her husband. In the
 fourth case, the corpse of a woman was dragged
 out of a well and as the cause of death could not be
 ascertained at the inquest the body was conveyed to
 the local Dispensary by the police; on getting ready
 for the Post-Mortem Examination a dead fetus dropped
 out of the winding sheet to the astonishment of the
 bystanders, Post-Mortem delivery having occurred
 on the way unnoticed by the bearers of the corpse. There were no
 signs indicating that any attempt to cause abortion had
 been made, there were no signs of drowning, the fetus
 was seven or eight months old, and its delivery was
 accompanied by total inversion of the uterus. Under
 these circumstances, the woman also being a widow, it
 was suspected that she died from the result of a
 drug taken to procure abortion and that her paramour
 had cast the corpse into the well to veil the cause
 of death. Strychnine was found in the viscera sent. The occurrence
 of child birth after the life of the mother had become
 extinct, without the aid of art and indeed even after

have the
 body
 sent
 to
 the
 police
 for
 the
 post-mortem

315/2 21
died. Atropine was extracted from his stomach
and from the toddy in which were also
found Datura seeds.

(b) In another a woman committed suicide, owing
to a quarrel with her husband, by eating
the Datura fruit, the seeds were found
in her stomach, from which also the
alkaloid was obtained.

(c) Four persons became delirious after eating a
pudding, and one of them also became
insensible and died; from the deceased's
stomach Atropine was extracted.

17. *Calotropis gigantea* was identified in four
cases; in one of them an abortion stick was armed
with the juice of this plant, and the remaining
three were suicidal cases in each of which the wife
owing to a quarrel with her husband drank the juice
of this plant, with fatal result in one case. The chief
symptoms observed were nausea and faintness.

18. Strychnine was detected in four cases: in a child
which died in convulsions four hours after taking
a "worm powder" presented by a native quack; in a
brahmin

308p 28
remained of the attack.

(d) Five persons fell in on a journey with a stranger who cooked the food for their mess, & supplied his own wants, and disappeared.

The five men soon after their meal "got mad" wandered about the village and were taken into custody by the police: they suffered from dryness of throat, hoarseness, disordered vision and talked incoherently as if drunk.

The vomited matters sent for Examination contained Gangah.

16. Datura. - and Atropine. - were found in four cases alone, and mixed with Gangah in one case.

In three cases returned under Datura parts of the plant used were also sent and were identified, in the other two cases returned as Atropine a mydriatic alkaloid was isolated. -

(a) Three Chuklers who were in the habit of stealing toddy off the trees became more than usually intoxicated on one occasion, and one of them who drank a larger quantity than the others became insensible and died.

it is the exception for them to send urine collected at
such examinations and the rule to concentrate attention
upon the "Stomach and Contents" when in all probability
the poison has passed through this organ long ago.
15 Ganjah was found alone in six cases, with Datura
in one, and in another with Aconite already referred to.

(a) Some food declared to have been given to a man
with intention to cause his death was found
to contain a large amount of Ganjah.

(b) An intemperate Civil Apothecary appealed
to a native quack for something to turn
him from his vicious habit, and he died
fourteen hours after taking the reputed
cure - the remainder of the medicine re-
turned out to be Ganjah, evidence of
which was also obtained from the stomach
and contents.

(c) A man was seized with vomiting immediately
after drinking arrack; Ganjah was found
in the vomited matter, also in the
remainder

288 267
than Morphia; but my experience is contrary to this, inasmuch as Morphine has been detected in many instances where no evidence of Meconic acid was forthcoming. It is not however probable that in these cases the more expensive alkaloid in its pure state would have been employed by the poisoner when crude opium is always so readily obtained; and Morphine is an alkaloid which resists decomposition well, Stas having found it thirteen months after burial. The constituents of Opium are known to undergo partial destruction in the animal body but a portion appears constantly in the secretions, particularly Morphine in the urine, the elimination from a single dose extending over five or six days. In Opium poisoning there is some loss of power over the bladder, and at the Post Mortem the bladder is usually found full of urine; so that the conditions for detection of this alkaloid after death are most favorable. It would therefore be well if Medical officers would bear this in mind during Post Mortem Examinations, for

1278
suffered from well marked symptoms
of strychnine poisoning, an hour after eating
food, which had been sent by a brother
of the same cloth, ending in the death
of three of them.

(d) A man complained of uneasiness in stomach
two hours after a meal followed by other
well known symptoms of strychnine poisoning
and died in four hours. His wife had put
"some powder" in his curry at the instigation
of a more favored companion.

14 Opium was detected in four cases and in three
others the alkaloid ^{Morphine} ~~was~~ was extracted from the
viscera sent. In one of these cases the medical
officer had fortunately secured and sent the urine
which was found in the bladder during the Post
Mortem Examination, for as it happened the alkaloid
was readily extracted from this article when only
doubtful evidence of its presence in the stomach
could be obtained. It has been stated that
"Inconic acid appears to resist decomposition better
— than —"

were detected:-

Table V

26 8/2

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	1889	1888	1887	1886	1885
Cases included in class A	33	20	9	5	13
" " " " B	8	12	2	11	6
Number of individuals affected in A+B	59	51	20	47	26
" " Deaths in A and B	28	17	9	2	7

13. Scorite was detected alone in seven cases, with Opium in one case and Gyanjah in another.

(a) Four boys were poisoned, two fatally, by stealing toddy from the pots tied to the date tree. The toddy climber had evidently poisoned the toddy in order to deter future robbers.

(b) A woman after some disagreement with her husband left the house ostensibly to collect firewood. As she did not return in the evening a search was made and she was found dead in the draft river. Her

(c) A priest and his family (seven persons in

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enmity with her husband) on his promising to give her something in return to put into her husband's food which would stimulate his waning affections for her. The husband discovered a piece of glass which stuck on his tongue during a meal and his wife confessed what she had done. The vomited matter and remainder of food contained a good deal of coarsely powdered blue glass, such as native bangles are made of.

12. Organic Poisons.- The use of this class of poisons has increased very much during the last two years. During the four years 1884-87 the percentage of organic poisons to total poisons detected ranged in round numbers from 33 to 18 in a declining ratio, in 1888 the percentage rose to 43.8, and in the year under review to 45.6. The following table shows comparatively for five years the more important particulars of the cases in which organic poisons

^{my 8/}
'a Snake-charmer woman gave her some
'medicine (Inscorial) and introduced an
'abortion stick into the womb; she was then
'placed on her back, held firmly down,
'and severely trodden on the abdomen.
'This was repeated at intervals through the
'day, each operation being preceded by
'a dose of the medicine; after the third
'operation she could no more walk about
'and complained of great pain, and the
'treatment was discontinued for the night.
'Next day it was commenced again and
'continued at intervals till the afternoon,
'the woman's agonies increasing all the
'while and ending in the expulsion of the
'foetus and death of the mother. The Post
mortem signs (notes of which were most
carefully recorded) fully corroborated
the above account.

11. Bangle-glass. - A woman gave her bangles to
a man (who it turned out was an
enemy).

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(b) As an example of wanton cruelty perpetrated
apparently in the absence of provocation
the following could scarcely be surpassed.
Some persons forcibly held down a woman
and pushed some stuff (Perchloride of
mercury) into her mouth and elsewhere.
She consequently suffered all the agony
of severe mercurial poisoning with
sloughing of the mucous passages which
came in contact with the poison. The
Post. Mortem examination revealing a
shocking state of things. She woman died
after nine days, but traces of mercury
were obtained from the Liver and Kidney.

(c) As an example of native medical treatment
which is now-a-days not so frequently
heard of:- A young married woman
who was turned away by her husband
became pregnant through illicit intercourse
and with the connivance of her paramour
procured abortion in the following manner

22 20

of gratuitously supplying milk for his children during ten days previous to their death, and a double quantity was supplied on the night on which they took ill after supper. The baby died in two hours and a lad four years old in three hours; the remnant of milk and evacuations were not procurable, but Arsenic was found in the exhumed viscera.

10. Mercurial Compounds were discovered alone in ten cases and together with Arsenious oxide in three cases, of which the following may be briefly mentioned:-

(a) An instance of rankling jealousy long after it had been provoked: a woman was discarded by her husband during her pregnancy which he suspected to be the result of infidelity to him; and he was jealous of the child which she gave birth to. In a fit of revenge four years after he contrived to send poisoned plantains to this child and destroyed it.

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and one of them died in a few hours.

(g) A man married a second wife whom he brought home in spite of the remonstrances and threats of the first wife, and the latter poisoned him with Arsenic.

(h) In return for some slight services rendered to a neighbour a man received a present of sweetmeats which he shared with his wife and three children; after eating it they all suffered from vomiting and purging caused by white Arsenic, eight grains of which were extracted from the remainder of the sweets.

(i) A man lost two of his children in one night, and six days after burial the corpses were exhumed as the father began to suspect foul play. A milkman, who he now learnt was very friendly with his inveterate enemy, was in the habit

20 9/2 18

nearly two hundred and sixty-five grains of white Arsenic having been extracted from the viscera and vomited matter.

(d) An attempt to poison a brother was frustrated by the offender being discovered in the act of putting some white powder (two grains and a half of white Arsenic) into the drinking water pot.

(e) A rich ryot and twenty three servants of his suffered from severe vomiting, and stomach-ache for eighteen hours after eating their mid-day meal. White Arsenic was found in the remainder of the food and in the vomited matter sent.

(f) Two girls went to the river for "Poojah," where the Brahmin gave them sugar and plantains; shortly after eating these they were both seized with the usual symptoms of arsenical poisoning and

19. 8/ 17
seized with vomiting and purging and
died. Suspicion of poisoning fell upon
his mother who it was said was instigated
by her paramour. The body was exhumed
some days after, and five-hundredths of
a grain of white Arsenic were found
in the portions of the body sent; some
substance subsequently found in the
evacuations contained nineteen grains
of white Arsenic.

(b) A woman, who introduced into her husband's
food "some medicine in order to regain
his affection," failed to secure
her object by his very narrowly escaping
death; four-fifths of a grain of white
Arsenic being found in a small portion
of the food which was left.

(c) A case of suicide by Arsenic which was
admitted into one of the Hospitals in
Madras is remarkable for the magnitude
of the dose which must have been taken.

of which 39 were Homicidal (including six deaths in cases of Criminal abortion), 12 were Suicidal, and 2 doubtful.

8. Inorganic Poisons.—The more important details of the cases in which poisons of this class were detected are furnished below with the corresponding details for four previous years:—

Table IV.

	1889	1888	1887	1886	1885
Cases included in class A	36	31	40	45	34
" " " " " B	13	10	11	13	11
Number of individuals affected in A+B	98	76	90	98	91
" " deaths in A and B	25	21	30	24	22

Arrange the preparations of Arsenic alone, or together with some other poison, head the list in the order of frequency.

9. The following cases of Arsenical poisoning may be briefly noted:-

(a) A man shortly after eating a meal was ^{sleepy}

17 15
(2) A man having quarrelled with his wife swallowed "the juice of some leaves," suffered from vomiting and died two days after. Post mortem examination afforded no clue to the nature of the poison.

(3) A man was found dead in the house of a prostitute and the medical officer certified that the Post mortem signs were "not inconsistent with alcoholic poisoning;" the medical officer was unfortunately not made aware of the suspicion of death being due to alcohol till after he had added spirit to the viscera secured for Chemical Examination.

7. Of the 90 cases in which poison was detected, Inorganic poisons were discovered in 49 and Organic Poisons in the remaining 41. The total number of deaths ascertained to be due to the effects of Poison was 53 (including 1 in class B)

168/74

"alone at night after having Sexual intercourse
"with his wife". After the burial of the corpse
the two older wives produced further evidence
against the youngest wife, her father, and three
others; and consequently exhumation was ordered
with the view of sending the viscera for
Chemical Examination. In the meantime
the grave had been disturbed (by animals?)
no viscera could be found, and only some
pieces of bone and earth from the grave
were obtained and forwarded, in which
no poison was detected.

(C) Cases in which the balance of evidence appears to be in favor of death by poison but in which no poison was detected:-

(1) A girl after eating some root (suspected to be oleander) suffered from nausea, and giddiness, became insensible and died. Post. mortem examination revealed intense congestion of stomach and intestinal tract.

(2)

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into hospital; at the Post-mortem examination
the evidence of death being due to "an old"
"clot in the basilar artery of the brain" was
considered insufficient, ~~account for death,~~
and the viscera were forwarded for
Chemical Examination. In the eighth
case it was reported that a man went
out after supper to watch his straw heap
in the field and was found dead there
next morning. He was the husband of
three wives, and to clear up suspicion
which fell on the youngest wife, the
local Medical officer made a post
mortem examination and certified
that death was caused by "Coma,
"the result of sudden shock due to a
"Severe fright" corroborating in a way
the verdict of the Panchayat who
recorded that the man was "struck
"dead by a devil because he worked
alone

necessitated chemical investigation:-

Cholera _____ 4

Hæmorrhage, & Septicæmia
following abortion, and
other accidents of Pregnancy } 6

Suicidal Hanging _____ 1

Paralysis, Phthisis &c. _____ 5

16 Deaths.

(b) Cases in which while there is insufficient or
no evidence in favor of a disease cause, there
is also little or no evidence in favor of the
death having resulted from the adminis-
tration of a poison. In six cases the sole
ground for suspicion, rested on the fact
that death was sudden: the majority
of these died after suffering from symptoms
resembling those of Cholera, one probably
from infantile Convulsions and another
during a drinking bout. The seventh case
was that of a man who died without
recovering consciousness after admission
into

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of ergotism arising from the use of the affected grain as food are well known; a disease appears in Cumbu in which the affected grain is said to resemble ergot of rye, but I have not been able to discover any instances in which Cumbu has proved poisonous, nor does there seem to be any authentic discovery of disease in Varagu to account for its occasional poisonous behaviour. The poisonous grain does not appear to be the product of a variety, but of the plant which yields the healthy grain. An instance of poisoning by eating Cholam grain, apparently diseased, recently occurred in the Annamalai District, but the examination of the grain has not yet been completed.

Group II. In this group of twenty-six cases, there were reported to be twenty-seven deaths and from the information furnished regarding them, the notes of Post-mortem examinations, and medical officer's certificates &c. &c., they are divisible into three sub-groups:-

(a) Cases in which the evidence of death being due to disease or injury preponderates over the evidence in favor of the suspicion which necessitated

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which has been accidentally introduced. In the present case a most careful search was made for foreign grain and the samples sent were examined chemically and microscopically without discovering any difference between them and locally purchased grain; samples were also sent to Dr. Shurston, who reported to the same effect. The precise nature of the poison in Darnel and in Varago is unknown. It is believed that the Varago grain raised at the proper season is wholesome while that raised on the same ground as a second crop and that raised on wet marshy ground are unwholesome, and it is also said that only the new grain exhibits poisonous properties; but these statements do not appear to be based upon reliable observations. The possibility of the grain being diseased has also been suggested and Dr. Bonavia of Bengal "thinks after rain falls and the ear is ripening, a fungus attacks it and it is this which is to blame, and that by washing the grain previous to cooking it renders it harmless." Various cereals are liable to become poisonous when attacked by fungus, and outbreaks of

with the case are forwarded and when discovered to
be non-poisonous are not credited as detections, although
their identification may have involved an extended
Examination. An instance of Varagoo poisoning, reported
from Tindivanam, fortunately without fatal consequences,
may be noted here. Thirty-one persons, after eating new
grain purchased in the local bazaar, were attacked
"with vomiting, followed by giddiness and inability
"to stand upright, their eyes were jaundiced, they could
"not recognise bystanders and they became semi-comatose
"for three days. The vomiting, in some cases was so severe
"that no nourishment could be given by the mouth
"for two days. Nine of them also had fever after the
"third day." Poisoning, as a result of eating this grain
is occasionally met with in India in the same way
that Darnel poisoning, occurs from eating bread made
of flour in which accidental intermixture of the
seeds of this grass with wheat has occurred: the symptoms
of Varagoo poisoning also resemble those of Darnel
poisoning, so much so that it has been suggested
that Varagoo poisoning is really poisoning by Darnel.

1081-8-16
b. The balance of 46 cases of alleged poisoning in which the Chemical Examination did not result in the discovery of any poison may be primarily divided into two groups viz:-

Group I Consisting of twenty cases in which only symptoms (such as nausea or vomiting) occurred under circumstances which aroused suspicion but without a fatal result - and

Group II of twenty-six cases in which a fatal occurrence was reported to have occurred under suspicious circumstances.

Group I. In many of these cases the nature of the articles sent preclude the possibility of more than a partial Examination being carried out e.g. the search for a vegetable poison in three or four large chatties containing earth picked up from the floor of a house or from a dust-pit in the back yard and labelled "vomited matter", "remainder of food" etc. is a hopeless task and has often to be abandoned for more useful work. Frequently again only articles having some indirect and often uncertain connection with

Table III
Human Cases - Class B) ided

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Including Cases in which no viscera or evacuations were received for examination, but only suspected substances, food, &c.

Districts received from	Number of Cases	Number of Cases in which poison was detected	Number of analyses	Poisons																
				Inorganic							Organic									
				Arsonious Oxide	Chloruric Salt	Cyanide	Mercurous Oxide and Lead Sulphide	Pot. Oxide of Mercury	Hydricine	Calotropis	Gigantia	Gangah	Andromeda and Stenopacton	Opium	Atropine	Scorite	Gangah and Opium	Gangah and Datura	Aduram	Chasafakta
Amantapur	2	"	2	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Arcoot, North	5	2	10	"	1	"	"	"	1	"	"	"	"	"	"	"	"	"	"	"
Arcoot, South	3	1	9	"	"	"	"	"	"	1	"	"	"	"	"	"	"	"	"	"
Bellary	2	2	6	"	"	"	"	"	"	"	1	1	"	"	"	"	"	"	"	"
Canara, South	2	1	3	1	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Coimbatore	1	"	2	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Cuddapah	2	2	3	"	"	2	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Gangam	2	1	2	"	"	"	"	"	"	"	1	"	"	"	"	"	"	"	"	"
Godavari	1	1	3	"	"	"	"	"	"	"	"	"	"	1	"	"	"	"	"	"
Kistna	1	1	1	"	1	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Kurnool	4	3	8	3	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Madura	4	3	5	2	"	"	"	"	"	1	"	"	"	"	"	"	"	"	"	"
Nellore	1	"	1	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Salim	2	2	2	1	"	"	"	"	"	"	"	"	"	"	1	"	"	"	"	"
Trichinopoly	1	"	1	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Tinnevely	2	2	4	2	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Total for 1889	35	21	112	9	2	2	"	"	1	2	2	1	1	1	1	"	"	"	"	"
" " 1888	36	22	74	8	"	"	1	1	"	1	1	"	"	2	2	2	1	1	1	1

Table II.

Human Cases - Class A.) *id est*

Including cases in which viscera or evacuations were examined, with or without suspected substances, food, &c.

Districts received from	Number of Cases	Number of Cases in which poison was detected	Number of individuals affected	Number of deaths	Number of analyses	Poisons																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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						Arsonious Oxide	Mercuric Salt	Opium	Arsonious oxide and Barytes	Arsonious oxide and Strontine	Arsonious oxide and Potash	Mercuric Salt	Baryte glass powder	Copper Sulphate	Cinnabar and Arsonious oxide	Arsonious oxide and Strontine	Arsonious oxide and Potash	Picric Acid	Opium and Barytes	Carbon Sulphur	Strontine and Opium	Arsonious Oxide	Galatophyllite	Galatophyllite, Arsonious oxide and Potash	Arsonious Oxide	Strontine	Barytes	Plumbago	Opium	Strontine and Galatophyllite	Strontine	Galatophyllite	Galatophyllite	Unidentified poison																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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The precautions enjoined with regard to the testing of
Country Spirit for Copper, before its use for preservation
of Human viscera, however appear to be disregarded.
Rectified Spirit is what every Medical officer is
expected to provide himself with for preserving viscera
for Chemical Examinations; but in the event of his being
obliged to use Country Spirit, knowing how frequently
such spirit is contaminated with Copper, it is necessary
that he should avoid the risk of complicating the
case by using such spirit unless he has previously
ascertained as far as possible that no Copper is
contained in it. This obligation can be readily
discharged by carrying out the test previously
described - a test which it is in the power of even
a Hospital assistant to carry out without any
difficulty.

5. Out of 136 Cases, requiring the examination
of 607 articles, poison was detected in 90 or 66.18
per cent of the cases examined - an unprecedentedly
high figure, the highest hitherto recorded having
been

600 5
786
been 57.48 percent in 1888. The usual information
regarding these cases of human poisoning, is shown
in the two tables below:-

3. The number of Medico-legal cases requiring investigation exceeded that of the previous year by nineteen, involving an increase of work indicated by 123 Separate analyses in excess of the previous year's number under this section - the total number of articles examined (885) having been exceeded only once during the last ten years viz: in 1886 when there were 916. In the miscellaneous work of the department also there was an increase during the year under review, represented by 150 analyses in excess of the previous year's number, the total number of separate analyses performed being greatly in excess of any previous year's record. The work under this section has been steadily increasing year by year and has now more than doubled since 1880.

MEDICO-LEGAL SECTION) *caps*

S.C. (I. Cases of Suspected Poisoning (Human))

4. There has been a noticeable improvement in the observance of the Rules relating to transmission of articles for Examination, and only a few instances of disregard of these Rules occurred which were at the time brought to the notice of the Surgeon-General.

The

Table No. I.

4

		Number of Cases		Number of articles received for examination	
		1889	1888	1889	1888
Medico-legal	I. Suspected poisoning (human)	136	127	607	520
	II. Do blood stains &c.	29	26	84	88
	III. Do Seminal stains	2	3	3	15
	IV. Do poisoning of Cattle	68	60	191	139
Miscellaneous	For Government departments	804	654	804	654
	Municipalities and private parties				
Total		1039	870	1689	1416

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CHEMICAL EXAMINER'S OFFICE,
Madras, 25th March 1890.

No. 226

From

J. L. Van Geyzel Esq. M.B., C.M., F.C.S., F.I.C.
Acting CHEMICAL EXAMINER,

Madras,

To

The Chief Secretary to Government
Public Department
Madras

Sir,

I have the honor to submit the
annual report of the work performed in the Chemical
Examiner's Department during the year 1889.

2. In the following table, the
analytical work is shown in comparison with that
of the preceding year:-

1890
No 2217
From

By
The Chemical Examiner
Madras

To

The Surgeon General
with the Government
of Madras.

NO. 225

Dated } 25th March 1890
Received }

CO. 357-60
14/5-90

Enclosure.

Subject
Forwarding the Annual
Report of the Chemical
Examiner's Department
for the year 1889, for
transmission to Government.

Res. 96/90

CHEMICAL EXAMINER'S OFFICE,

Madras, 25th March 1890.

No. 225

From

J. L. Vanhuyzel Esq. M. B. C. M. F. C. S. F. I. C.
Acting CHEMICAL EXAMINER,

Madras,

To

THE Surgeon General with the
Government of Madras.

SIR,

I have the honor to forward
the annual report of the Chemical
Examiner's Department for the year 1889
for transmission to Government.

I have the honor to be

Sir

Your most obedient Servant

Wanhuyzel M. B. C. M. F. C. S. F. I. C.

Ag. Chemical Examiner