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[Despatch Abstract.]

Chemical Examiners
report.

Reviewing the
for 1890 and
furnishing copies
of proceedings to
the Govt of India

28
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OFFICE OF SURGEON-GENERAL

WITH THE GOVERNMENT OF MADRAS,

No. 232 *Nunpambankura*
Fort St. George, 19 March 1891.

From

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 forward herewith the Annual Report of the Chemical Examiner for 1890 which like that of 1889 is both interesting and valuable.

2. There was a slight decrease in the number of Medico-legal examinations conducted during the year but the miscellaneous Chemical Analyses increased from 804 in 1889 to 885 in 1890.

3. I would draw the attention of Government to para 29 of the report in which the Chemical Examiner expresses a hope that results of legal trials will be attached to the Records of every Criminal case that in future comes under investigation in the Department.

I have the honor to be,

Sir,

Your most obedient Servant,

Yours

John H. H. H. H.
General with the Govt. of M

of papers given below:-

Public (1891) DEPARTMENT.

From

THE SURGEON-GENERAL WITH THE

GOVERNMENT OF MADRAS,

Fort St. George,

No. 232

Dated 19th March 1891.
Received

No.

Encl. 1.

SUBJECT.

Forwarding with reman
the Annual Report of the Chemist
Examiner for 1890.

Put on type
by the printer
and the printer
please. H.
21/3

CHEMICAL EXAMINER'S OFFICE,
Madras, 12th March 1891.

No. 219

From

J. L. Van Geyzel Esq. M. B. C. M. & C. S. F.

CHEMICAL EXAMINER,

Madras,

To

THE Chief Secretary to Government,
Public Department

SIR,

I have the honor to submit the
annual report on the work of the Chemical Department
for the year 1890.

2.

The number of Medico-legal
examinations was less than in the previous year by 29
cases, though the difference in the actual number of
analyses performed in this section was only 21 viz: 864
against 885 in 1889, which was an exceptionally busy
year. The miscellaneous chemical analyses during 1890,
which had exceeded the work done in any previous
year, has been exceeded in the year under review by 81
analyses. These facts are demonstrated by the table
of figures given below:-

Table I.

3. 2. 3

		Number of Cases		Number of Articles received for Examination.	
		1890	1889	1890	1889
Medico-legal	I Suspected poisoning (Human)	116	136	609	607
	II " Blood stains &c.	33	29	99	84
	III " Seminal Stains	3	2	5	3
	IV " poisoning of Cattle	54	68	151	191
Miscellaneous	For Government Departments,	885	804	885	804
	Municipalities and private parties				
Total		1091	1039	1749	1689

2. 2. 100 (

MEDICO-LEGAL SECTION

3
48

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

3 Though the number of cases in which
Chemico-legal analyses were required was fewer than in the
previous year, the number of analyses performed was practically
the same viz: 609 against 607 in 1889. The percentage of
detections in 1889 suddenly rose by 9 per cent over any
previous year's record, in spite of the fact that the work of
that year was unusually heavy, and this high percentage
(the result of improved methods of work and of the un-
ceasing patience and willingness with which the assist-
ant Chemical Examiner and the other assistants generally
carry out instructions), has been closely maintained during
1890 also. Out of 116 cases which came under investigation
poison was detected in 76, or in 65.52 per cent of the cases
against 66.18 per cent in the previous year. Information
regarding these cases is given as usual in the two following
tabular statements:-

Table II. Human Cases - Class A

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

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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																								
						Inorganic						Organic																		
						Arsenious Oxide	Arsenious Oxide and Realgar	Arsenious Oxide, Hyposulphuric Acid, and Sulphuric Acid	Atropine	Araggins oxide and Phosphorus	Arsenious oxide, Hyposulphuric acid and Colicel	Mercuric Salt	Opium	Rawle glass powder	Picrotoxin	Aconite and Opium	Abrus Precatorius	Calatropis gigantea	Gyneria, Aconite, and Gyneria	Aconite	Opium	Datura	Phosphorus	Phosphorus	Datura and Gyneria	Phosphorus	Atropine	Gyneria	Morphia	Unidentified Poison
Anantapur	3	2	3	2	18	2																								
Arcot, North	4	3	19	4	30	3																								
Arcot, South	8	6	17	4	39	3						1															1	1		
Bellary	3	3	5	3	15	3																								
Canara, South	3	2	3	3	15	-									1												1			
Coimbatore	3	2	3	3	28	2																								
Cuddapah	3	1	4	2	11	1																								
Ganjam	7	5	18	12	38	2						1											2							
Godavari	9	6	10	8	70	2						3						1												
Krishna	10	8	18	5	61	3			1	1							1	1	1											
Karnul	2	-	2	1	5	-																								
Madras	3	1	9	1	16	1																								
Madura	4	2	12	3	19	1			1																					
Vellore	9	9	12	5	48	4						3						1	1											
Talera	3	2	21	1	17	1																								
Tanjore	6	6	19	6	61	5						1																		
Tiruchinopoly	1	1	3	1	9	1																								
Tinnevely	7	4	9	2	30	3																								
Vizagapatam	3	3	13	4	20	3																								
Cochin	1	-	1	1	1	-																								
Total for 1890	92	66	201	71	551	40	-	-	1	1	1	9	-	-	1	-	-	2	-	2	3	3	-	-	-	2	1	-	-	-
1889	101	69	159	79	545	21	1	1	-	-	-	8	1	1	-	1	1	2	1	7	3	2	2	1	1	3	1	4	3	1
1888	101	69	159	79	545	21	1	1	-	-	-	8	1	1	-	1	1	2	1	7	3	2	2	1	1	3	1	4	3	1

Table III - Human Cases -
Including Cases in which no viscera or evacuations were received.
Suspected Substances, food,

lass B.

682-5

78⁶
D. 1111.

Group II

There were 40 cases of suspected poisoning in which the Chemical Examination failed to discover any poison, and which may be briefly noticed here. These cases fall into two groups viz:-

Group i. - Consisting of 25 cases in which suspicious symptoms occurred, unattended by a fatal result, and

Group ii. - of 15 cases in which death occurred under suspicion of poisoning.

Group i. - In these cases miscellaneous articles found in a search, or excreta gathered from a dust heap, are the usual materials of which an examination for the discovery of poison is sought. In nearly every case under this group the suspicion of poisoning rested only on some strangeness in the taste or color of the food, or on vomiting after a meal or on the mere statement of a selfish female that she had taken poison to put an end to herself.

Group ii

Group II - This group of 15 cases includes 19 deaths and from a study of the information available regarding them they may be disposed of as follows:-

(a) Cases in which the magisterial reports, post-mortem notes &c. point to death from disease or injury, but in which a Chemical investigation is sought in order to confirm or eliminate any suspicions due to other circumstances:-

	Deaths
Fever	2
Cholera	1
Heart disease, Bronchitis	3
Consequences of Abortion	4
<u>Total</u>	<u>10</u>

(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 being the result of poisoning.

(1) A man fell dead during
a

a fight, the wounds on his body were insufficient to account for death, and no internal cause of death could be made out at the post-mortem examination owing to advanced decomposition. In anticipation of the defence setting up the plea of death from poisoning, a chemical examination was advised.

- (2) A man died after sudden vomiting and purging, and it was reported after burial that he met his death by violence. The body was exhumed, no evidence of violence was obtainable and so the decomposed organs were sent to be examined for poison.
- (3) A man who was under native treatment for old standing disease of testicle was in great agony, and his

his friends left him after missing him through part of the night; the next morning he was missed and his corpse was discovered in a neighbouring well. At the usual signs of drowning were absent at the post-mortem examination a chemical examination was ordered.

(4) Owing to a family quarrel husband and wife cooked their meals separately; an adopted child who used to share the father's meal suddenly took ill and died, and the mother absconded. At the post-mortem examination the base of the skull was found fractured.

(C) The remaining case belongs to the class in which the balance of evidence appears to be in favor

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favor of death by poison but in which no poison was detected. - Husband, his brother, wife, and two children were reported to have suddenly taken ill and died in a Khond village in the Ganjam hill tracts. When the nearest apothecary arrived on the scene, two persons were dead, two more were found comatose and died in a short while, and the fifth was found "wandering about like a mad man, bawling out; his pupils were dilated, replies incoherent; he gradually became insensible and died." The Post-mortem examination afforded no clue to the nature of the poison; and no further information of any kind was available, as the villagers had all taken fright and fled from the village.

5. In the 76 cases in which poison was detected there were 54 deaths; in 59 of these cases inorganic poisons were ascertained to be the cause of death, and organic poisons in the remaining 17.

Inorganic

Inorganic Poisons

11
128

b. The following tabular statement affords the usual information regarding cases which have occurred from this class of poisons for five years:-

Table IV

	1890	1889	1888	1887	1886
Cases included in class A	52	36	31	40	45
----- B	7	13	10	11	13
Number of individuals affected in A and B	159	98	76	90	98
----- of deaths in A and B	47	25	21	30	24

7 The physical properties of Common White Arsenic are all in favor of its easy administration, its action is rapid and certain, its effects strongly resemble a fatal disease which is of frequent occurrence in this Country, it is procurable with the greatest ease in every bazaar; and so this substance continues to be the favorite weapon of the poisoner. In the face of evidence that death was the result of Arsenic, with a strong presumption

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presumption of guilt against an accused, the prosecution fails in many such cases for want of evidence to connect him with the poison. The necessity for restricting the sale of poisons though recognised has I believe been superseded by the difficulties in the way of applying any extended measures of restriction; but even a partial restriction, to the extent of limiting the power of selling to certain classes of shops and requiring the vendor to keep a simple register of sales of Arsenic and Mercurial Compounds only, at first, might help the Magistracy to trace these poisons to the possession of an accused with greater certainty than at present.

8. The following cases of Arsonical poisoning are worthy of brief reference:-

(a) A woman having failed to obtain maintenance from her paramour destroyed her child, the issue of their intimacy.

(b) A man took his wife to a neighbouring village to consult a native quack;

immediately

immediately after eating a meal, when
 her husband provided for her there
 she was seized with vomiting and
 purging. She returned to her own
 village on foot next day, and it was
 sworn that in her weak state she was
 overpowered and strangled. The post-
 mortem examination did not take
 place for ten days and only traces
 of Arsenic were found in the viscera,
 while half a grain of White Arsenic
 was extracted from earth mixed
 with excreta.

(c) Aman suffered from grinding pains
 in the stomach, vomiting and purging,
 for 23 hours and died, and was
 buried. The next day his niece also
 became ill with the same symptoms
 having attempted suicide by eating

Some of the love medicines which she gave to her uncle at the instigation of another, who was her uncle's rival in adultery with her. The soiled and clothes of the prisoner and the exhumed viscera of the deceased were found to contain arsenic, and she was sentenced to 18 months' rigorous imprisonment for causing death by a rash and negligent act.

(d) Two men quarrelled about water, which they shared in turns for irrigation, and the villagers interfered and settled the dispute. One of the parties not satisfied with the settlement took up a handful of dust, showed it to the sun and dropped it—a form of curse indulged in by Hindus during a quarrel—and

declared that whoever was guilty of injustice would lose his son by next morning. The same afternoon this man contrived to administer poisoned jagguuf to the other man's son, who fortunately recovered under timely treatment in the dispensary. The vomited and purged matters contained Arsenic, the purchase of jagguuf that day by the accused was proved, and he was sentenced to 4 years rigorous imprisonment for attempting to commit murder.

(E) In a fit of drunkenness a man stabbed 3 of his neighbours one of whom died instantly, and he chose for himself the agonies of death by Arsenic.

(F) Eleven guests at a ceremony were

Seized with vomiting and purging
after a meal, which the host obtained
from eating, and two of them died.

(g) A woman lost some jewels from her
house and a reputed magician
offered to recover them for a reward
of Rupus 2. He gave her some sanctified
rice to distribute among the neighbours
which, he said, would compel the
thief to Confess; but this puse failed.
He then prepared some balls which,
he said, would give the thief a
pain in the belly; and of the neighbours
who came by invitation to witness
the trick, twelve persons ate the balls
which were distributed by him. One
of these was soon after seized with
the usual symptoms of arsenical
poisoning and died. It appears

1887

that deceased was more strongly suspected than any one else of having stolen the jewels, which were mysteriously restored to the house of the owner during the night of his illness and death. The Magician was sentenced to seven years' rigorous imprisonment for his successful performance.

(h) Two boys were given some jaggor by an old woman and one of them immediately "vomited" went off "to sleep and died in six hours," the other fell asleep in fifteen minutes and died in five hours without any other symptoms. These are instances of an uncommon form of arsenical poisoning, in which the nervous system becomes affected, resulting in coma, like in opium poisoning.

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19 86

the absence of gastro-intestinal symptoms in the second boy is also noteworthy. Similar instances have been met with occasionally and noted in previous years' reports.

(i) A man visited another's flat about, on the strength of a former intimacy, with her, and she received him with favor. This led to a quarrel between the men, who vowed vengeance against each other declaring that each would convert the other's house "site into a field of Castor oil plants," meaning extinction of the family, while the one engaged a man to work spells, the other stole a march on him by poisoning his son with an arsenical jagger ball.

(j) In order to obtain money which was

20/9

was refused on loan a man contrived
to poison the food of thirteen persons
and to be sent for to treat them for
Rupus food. His treachery was discovered
and he was sentenced to ten years
rigorous imprisonment.

(K) A woman Jane who had quarrelled
with her paramour refused to return
to him but received the visits of another
man. A friend with whom she was
living suffered from purging, vomiting
and sore eyes - all characteristic
symptoms of our dose of arsenic,
and she herself suffered from
similar symptoms and died; about the
same time a neighbour also died. It
seems that all three persons obtained
water from the same well, and the
paramour was suspected of having
poisoned

poisoned the well. There was no evidence
against the accused and he was
discharged; but arsenic was extracted
from J...e's organs equal to three-
fifths of a grain of white arsenic
and also in about a pint of water
taken from the well equal to one
hundredth of a grain. The quantity
found was very small but the
sample of water was not drawn
for some days afterwards. In the
judgment the insolubility of white
arsenic in cold water is given as a
reason against the possibility of
deceased having been poisoned
with arsenic through the well water,
and this is done apparently on the
authority of Taylor, though the latter
admits that cold water allowed

22 Jan
To stand many hours on this poison will
dissolve about half a grain of it in a
'fluid ounce'. A case of well poisoning
by Arsenic is recorded in the annual
report of this department for 1881-82,
and the following occurred during
the year under review.

(C) Nineteen persons after drinking
well water, in which two grains
of white Arsenic were found in
six quarts full, suffered from
vomiting, purging, and burning
sensation in stomach without a
fatal result.

9. Compounds of Mercury were found alone in
eleven cases, and in two along with arsenical Compounds.
A few of these are noteworthy:-

(a) A theft occurred, and a magician
with a reputation for detecting
thefts

23/4²²

thief, was employed to discover the
thief by sorcery. At a preliminary
sance, at which rice was thrown
on a winnow supported on the points
of a pair of scissors, certain persons
were suspected by the winnow shaking
when they threw rice. At the next
performance, the stolen property
was to be restored: before a large
crowd of people a hen was first
whirled about over a diagram on the
floor and caused to fall down
dead; then an image was moulded
out of flour and from it little
balls were made and distributed
to the suspected persons - one of these
became violently ill in about
fifteen minutes, lingered in pain
for eighteen days from miasma
poisoning

poisoning and died. The magician was sentenced to three years rigorous imprisonment.

(b) A woman was reported to have died after receiving a beating from her husband; but there were no marks of violence. The viscera sent contained mercury equal to one-fourth grain of Corrosive sublimate.

(c) Six members of a family immediately after eating cakes made from mango seeds suffered from giddiness, vomiting, pains in the head and abdomen, and four of them died. Two of the corpses were burnt; but in the viscera of the other two was found mercury.

Organic Poisons

10. This class of poisons was less resorted to during the year under review than in the two years immediately preceding

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preceding it, as will be seen from the following table:-

Table V

—	1890	1889	1888	1887	1886
Cases included in class A	14	33	20	9	5
————— " ————— class B	3	8	12	2	11
Number of individuals affected in A and B	28	59	51	20	47
———— " ————— of deaths in A and B	7	28	17	9	2

11. Datura and Atropine were detected in five cases alone and together with Arsenic in a sixth case. In the three cases of Atropine no parts of the plant could be obtained and only a mydriatic alkaloid was extracted from the articles sent; while in the three cases referred under Datura some part of the plant was also available for identification.

(a) Two persons after eating a morning meal were affected with delirium, incessant talking, twitching of

of muscles, clutching at imaginary objects, fits of laughter, difficulty of Swallowing, and dilatation of pupils. A magician who was sent for to discover the cause of these symptoms unwisely ate some of the food as an experiment and suffered similarly. In the meantime six other members of the family to whom food was sent out to the fields were found suffering in the same way, and one of them died.

(b) Two brothers-in-law put Datura seeds into the curry of three women who were their neighbours with a mischievous intent and were sentenced to two months' rigorous imprisonment.

(c) A Bengali Traveller joined a party of Mahomedans who had returned from

from Mauritius and were making
their way down from Calcutta
to Vizagapatam. On the way
the Bengali contrived to poison
his companions with Datura, with
the intention of robbing them, but
he was foiled in his scheme. He was
sentenced to seven years rigorous
imprisonment.

12. Aconite, and Opium were found only in three
cases each, against seven of each last year.

13. Strychnine was detected in two cases, in one of
which a man was poisoned by a native quack who
prescribed for Stomach-ache; in the other the poison
was apparently introduced into the food sent for examination,
and the man feigned symptoms which were inconsistent
with Strychnine poisoning, in order to intimidate a
fractious wife.

14. Juice of Calotropis Gigantea was swallowed
with

with fatal result by a woman on account of a quarrel with her husband.

15. Plumbagin was met with in one case only in which a widow died in consequence of procuring an abortion by it.

16. Picrotoxin, the active principle of the *Cocculus Indicus*, was the cause of death in a woman who was suspected of having committed suicide. The substance which she used was subsequently sent for examination and identified as the berries of *Anamitta Cocculus*.

Fatal human poisoning by *Cocculus Indicus* has very rarely been recorded, though it is a well known fish poison and is used as such in civilised countries; and it has also been used in England for adulterating beer and ported to increase their intoxicating power. It is a compound poison, producing gastro-intestinal irritation with stimulation of the spinal cord simulating in the latter respect the action of *Strychnine*. The occurrence of convulsions—
though

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though common enough with the frog - does not appear to
have been observed in the few cases of human poisoning
by Picrotoxin already recorded; and since Government
called attention to my remarks regarding this poison
in the annual report for 1887, careful enquiries have
been made in cases which have come under notice.
The original notes of the Medical officer who observed
the case under review record authentically that "Twitch-
ings and convulsions, with delirium" followed the stage
of vomiting.

17. Ganjah was found in a 'medicinal powder' produced
in a case of Criminal abortion; and also in some
jaggery with which a man in revenge attempted
to destroy his brother-in-law's child.

18. Multiple poisoning occurred in 35 of the cases
which were investigated, the largest number of persons
affected and killed in a single case being five; the
largest number of persons affected without a fatal
result being nineteen in an Arsenical case.

30-5-29

ii. Blood Stains

19. The following table furnishes the usual information regarding the examinations carried out in these cases:-

Table VI. - Blood Cases

Districts received from	Number of Cases	Number of cases in which blood was detected	Number of examinations
Anantapur	1	1	5
Arcot, North	2	1	4
Arcot, South	2	2	10
Chingleput	1	1	1
Coimbatore	4	4	11
Cuddapah	5	4	19
Kistna	1	1	18
Kurnool	2	2	3
Madura	4	3	10
Malabar	3	1	5
Vellore	2	2	3
Salem	2	1	4
Tanjore	1	1	1
Tinnevely	3	3	5
Total for the year 1890	33	27	99
-----"-----1889.	29	19	84

20. Of 27 cases in which the presence of blood was established, in thirteen human blood was identified. In the case from Kistna District, human blood was detected in seventeen out of the eighteen articles sent for examination. Twentyfour of the cases in which examinations for blood were performed related to the crime of murder, two to rape, two to homicidal wounds, ^{one} to suicide, and the cause of examination in four cases is unknown. The method of distinguishing human blood noted in last year's report requires further confirmation and its application to medico-legal enquiries has not yet been satisfactorily established.

III. Spermatic Stains

Table VII.

District received from	Number of cases	Number of cases in which sperm was detected	Number of examinations
Coimbatore	1	-	2
Ganjam	1	-	1
Kistna	1	1	2
Total for the year 1890	3	1	5
" " " 1889	2	-	3

21. Spermatozoa were detected in the Kistna case but the crime of rape was not proved, neither was it proved in the Coimbatore case. The case from Panjam was Sodomus, in which the result of the enquiry has not been communicated.

IV. Cases of Suspected Cattle Poisoning.

22. A much larger number of cattle deaths was reported than has been the case in recent years. Arsenical compounds as usual being almost invariably employed by the cattle poisoners.

Table VIII.

Table VIII. — Cattle Cases.

District 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 Poisons				Number of Cases in which poison was detected.	Number of Analyses	Nature of Poisons.		
					Arsenious oxide	Catalhopsis gigantea	Arsenious oxide	Realgar			Arsenious oxide	Arsenious oxide + Opium	Gangah
Anantapur	2	2	2	2	2	-	-	-	-	-	-	-	-
Arcot, South	-	-	-	-	-	-	-	-	1	1	1	-	-
Bellary	-	-	-	-	-	-	-	-	1	1	1	-	-
Chingleput	-	-	-	-	-	-	-	-	1	1	1	-	-
Cuddapah	2	2	2	10	2	-	-	-	-	-	-	-	-
Coimbatore	7	29	6	17	6	-	-	-	1	1	1	-	-
Godavari	3	11	2	23	1	-	1	-	1	1	2	-	-
Kistna	8	9	4	25	4	-	-	-	3	3	3	-	-
Kurnool	3	3	2	11	2	-	-	-	-	-	-	-	-
Madras	1	1	-	1	-	-	-	-	-	-	-	-	-
Madura	4	7	4	21	3	1	-	-	1	1	1	-	-
Malabar	-	-	-	-	-	-	-	-	2	1	2	-	-
Vellore	2	2	2	8	2	-	-	-	-	-	-	-	-
Tatam	-	-	-	-	-	-	-	-	1	1	1	-	-
Tanjore	-	-	-	-	-	-	-	-	2	2	3	-	-
Trichinopoly	1	1	1	4	1	-	-	-	4	4	4	-	-
Tinnevely	1	3	1	7	1	-	-	-	-	-	-	-	-
Vizagapatam	-	-	-	-	-	-	-	-	2	2	2	-	-
Total for 1890	34	70	26	129	24	1	1	-	20	19	22	19	-
- " - 1889	43	53	28	153	27	1	-	-	25	20	38	18	1

It should be explained that the seven cases with
twenty-nine deaths recorded in the Coimbatore district
include a case of Arsenical poisoning, in which
fourteen domestic fowls were found dead. The
percentage of detections was 83.3 against 70.6 in
the previous year.

MISCELLANEOUS SECTION

23. The work under this heading shows no tendency to
decrease or even to remain stationary; there were 885
analyses performed, against 804 in the previous year,
and of these thirty were for private parties and the
remainder in the interests of various departments of
Government.

Examinations made for Government Department, &c 367

Received from	Nature of substance	Number of examinations	Total number of examinations for the year
Boards of Revenue	Salt	367	
	Spirit	16	
	Malt Liquor	22	
	"Wash"	2	
	Rectified Camelline	1	
	"Boja" Liquor	1	
	Toddy	3	
	Gangah Lakium	1	
	Myrtane oil	1	
	Citronelle oil	1	
	Inspected substance	1	
Chemical Laboratory, Madras.	"Lonti"	2	
	Pills	1	419
	Rain water	14	
	Well water	1	15
	Medicines	2	
	Tannate of Copper	1	3
	Milk Punch	1	
	"Eau de melisse des Carmes"	1	
	"Eau de toilette" (Lubin)	1	
	Essence of Turpentine	1	
	"Eau de Rabel"	1	
Collector, South Arcot.	"Vin de Vial"	1	6
	Methylated Spirit	31	
	Kerosine oil	35	
	Cylinder oil	3	
	Rangoon oil	2	
Collector of Sea Customs			

Received from	Nature of substance	Number of examinations	Total number of examinations for the year
Collector of Sea Customs (Continued)	Engine oil	1	
	Lubricating oil	1	
	"Kainit"	1	
	Sand dust packing	1	
	Dynamite	6	
	Blasting gelatine	3	
	Getignite	3	
	Caoutchoucine	2	
	Malt Liquor	7	
	Chloroform	1	
	Eau de Cologne	1	
	Perfumes	19	
	P. Pierce's Golden medical Discovery	1	118
	Rum	4	
Commissariat Department	Malt Liquor	28	
	Carbolic powder	11	
	Ether	1	
	Ghee	2	
	Kerosine oil	6	
Director of Public Instruction	Sugar	2	54
	Water	1	1
District Magistrate North Arcot	Anack	1	
	Black powder	1	2
District Medical Officer Anantapur	Cholera	1	
	Raggi	1	2
District Medical Officer Bellary	Opium	1	1

		Number of Examinations	Total number of examinations for the year
Received from	Nature of substance		
Dist. Medical Officer, Calicut	Opium	1	1
" " " Madras	Opium	2	2
" " " Vellore	Opium	1	
	Explosive mixture used for fireworks	1	2
" " " Ganjam	Suspected intoxicants	10	10
Dep. Surg. Genl. A. M. Forbes Madras	Water	4	4
Executive Engineer Chingleput	Water	1	1
" " Bangalore	Sand for filter bed	5	
	Water	3	8
Ex. Engr. P. W. D. Hyderabad	Water	10	10
Jail Department	Supdt. Jail, Parvatipur	1	
	" " Coimbatore	1	
	" " Berhampore	2	
	" " Trichinopoly	1	
	Med. Officer H. M. Penitentiary	8	
	" " Jail, Rajamundry	2	
	" " " Vellore	3	
	Dist. Med. Officer Ganjam	1	19
	from Jail at Aska		
Magistrate, 2 ^d class, Ramnad	Poddy	4	4
" 3 ^d class, Palni	Ganjali	1	1
Medical Officer, Alur	Substances used by Alchemist	3	3
" " Trichinour	Substance suspected to have caused village fire -	1	1
Municipalities	Madras	24	
	" "	1	
	Salem	9	
	Kurnool	2	

Received from	Nature of substance	Number of examinations	Total number of examinations for the year
Municipalities	Cotacamund	Water	8
	Chandigarh	"	2
	Varanasi	"	6
	Coonoor	"	4
	Chithambaram	"	4
	Chennai	"	4
	Cuddalore	"	2
	Dindigul	"	5
	Adoni	"	2
	Madurai	"	5
Ordnance Officer, Arsenal, Madras	Bar Soap	1	3
	Rangoon oil	2	
Principal Medical Storekeeper, Madras.	Dilute Hydrocyanic acid	5	8
	Quinine Sulphate	1	
	Water	1	
Principal Medical Officer, N. M. Forces, in Madras.	Opium Refuse	1	6
	Brandy	2	
	Portwine	2	
	Sherry	2	
Supdt. of Stationery, Madras	Ink	28	28
Senior Med. Officer, General Hospital	Medicated Cotton wool	1	4
	Whisky	1	
Surgeon (Second) " "	Urine	1	4
" (Resident) " "	Quinine mixture	1	
Surgeon to H.E. the Governor	Water	1	1

Received from	Nature of Substance	Number of Examination	Total number of examinations for the year
Sub. Asst. Supt. Telegraph Stores-	Bichromate of Potash	2	2
Sub. Divisional Officer, Trivellore	Water	1	1
Superintendent, Central Museum, Madras.	Plumbago	1	
	Iron ore	1	2
Villupuram Guntakal State Railway	Water	35	35
	Water	4	
	Soil	3	
	Ink	3	
	Skins	4	
	Cinchona bark	3	
	Camel Salt petre	1	
	Kerosine oil	2	
	Bees wax	1	
Private Parties and Firms.	Gold Thread	1	
	Goat Hair	1	
	Quartz	1	
	Alizarine	2	
	Alc	1	
	Ground nut seeds	1	
	Hongay seeds	1	
	Castor oil seeds	1	30
	Total	885	885

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24. Waters. - The work of examining waters has increased
very much especially on account of Municipalities,
and applications for analyses from local bodies have
been more numerous than could be complied with
without dislocating more important work, and I have
been obliged in some cases to disappoint applicants.
Since Government disallowed the privilege, held so
long by the Chemical Examiner, of charging the
authorised fees for work done on behalf of
Municipalities, such work has increased over four-
fold. Work of this nature can only be performed
in the intervals of more important medico-legal
examinations, which take precedence of all other work,
but the flow of miscellaneous work is so uncertain
that it is impossible to know what and how much to
undertake, or to regulate it in any other way; for
arrangements made in anticipation are almost
invariably upset by sudden inflow of medico-legal
work, and hence the Chemical Examiner is obliged
to

to take everything that comes. Under these circumstances I beg that Government may now be pleased to restore the former relations of the Chemical Examiners to local bodies - relations which in the case of the Bombay and Calcutta Examiners have not been disturbed - or to place some other restriction upon the power of Municipalities to call upon the Chemical Examiners to undertake analyses for them. One Municipality forwarded a resolution requiring the Chemical Examiners to undertake (at the suggestion of their District Medical officer) a regular periodical analysis of the whole of the potable waters in their town, and this is only one of several similar cases. I have done my best to meet the most pressing needs in such cases as far as possible, but it is difficult to carry on the work with any prospect of meeting such requisitions in a satisfactory way.

In addition to 123 samples of water examined for potability, on behalf of Municipalities of

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of the Jail, and various other departments of Government,
thirtyfive samples of water were also examined as to
their potability and fitness for use in locomotive
boilers on account of the Villupuram Guntakal State
Railway. There were also examined fourteen samples
of Rain water in continuation of the examinations
began three years ago, chiefly to estimate the Nitrogen
brought down by Rain, and the condensed results
are given below:-

Analyses of Madras Rain Water - Monthly Results - 1890.

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	June	July	August	September	October	November	December	Total
Rainfall ————— Inches	3.87	7.56	1.62	2.42	5.26	4.49	0.86	26.08
Total Combined Nitrogen (as NH_3) lbs per acre	0.448	0.476	0.186	0.122	0.372	0.369	0.105	2.078
Chlorine (as NaCl) —————	6.305	7.736	2.740	2.619	5.283	5.110	1.435	31.228
Solids —————	15.292	17.102	9.162	8.958	15.575	20.315	4.863	91.267
Ash —————	9.646	8.551	5.497	2.986	5.949	10.157	1.945	44.731

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The assimilation of free Nitrogen by plants directly from the atmosphere, as opposed to the view that the source of plant Nitrogen is to be sought in the soil, and not in the air, has recently assumed a fresh aspect from results of experiments which are being carried on at Rothamsted. So far it appears as if the large amount of Nitrogen contained in leguminous plants may be derived from the free Nitrogen of the air being brought into combination under the influence of micro-organisms. The addition of a watery extract of soil, containing the appropriate organism, to a sterilized soil growing leguminous plants was followed by increased growth, and gain of Nitrogen.

25. Customs work. - 118 examinations were made on behalf of the Collector of Sea Customs chiefly with reference to duty leviable on alcohol in the case of substances whose spirit strength cannot be gauged in the usual way. Of thirtyone samples of ethylated

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Methylated spirit sent for examination twenty six and passed as being "sufficiently methylated" according to the orders of Government, and five were rejected. There were also thirty five examinations performed under the Petroleum Act and twelve under the Explosives Act without any rejections.

26. Salt. - 367 samples were analysed during the year, being a larger number than usual.

27. Ergotism. A wide spread attack of this form of poisoning occurred in some villages of the Penutkonda Taluk and samples of the suspected grain (Raggi and Cholum) were sent for examination, with a full report of the outbreak and spread of the disease. Numbers of people suffered from burning sensation in the stomach, followed in a few days by vomiting and diarrhoea, (which was in some cases bloody) cramps in the muscles of the abdomen and thighs, with loss of consciousness and death. In non-fatal cases wasting of the

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muscles of the lower limbs with partial paralysis was a frequent sequela, and in a few cases mortification of the digits. It was roughly computed that 107 persons were attacked, and 30 died. The disease was also found to be confined to the poorer classes, who had readily purchased grain which was known to have been harvested early on "account of its being attacked by blight". On examining the grain in the house of the attacked people Doctor Hackett Watkins says that "some of it was found sprouting and the larger portion was black". The sample grain sent for examination was not so bad as this, and Mr. Lawson, the Government Botanist, who was kindly examined the grain, reported that both grains (Raggi and Cholum) "had been harvested before being fully matured; and there are on many of the grains patches of ergot, but in no case has the interior of the seed been attacked."

28. The Assistant Chemical Examiner and the other members of the department have performed this

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their duties throughout the year with great care and zeal. The entries in the Service books of those, for whom these registers are required to be kept, have been duly made and are up to date.

29. While infringements of the rules relating to packing and testing of spirit for copper have been reduced to a minimum, disregard of the orders relating to the results of trials in Criminal cases, in which Chemical Examination is sought, is still frequent though there has been a marked improvement in this respect during the year. It is hoped that it will be possible to render complete the records of every Criminal case that in future ^{comes} ~~comes~~ under investigation in this department, by having the result of the legal trial also; as without these records lose a great deal of their scientific value.

30. The usual statement embodying the statistics shown in the body of the report is appended.

IX. Tabular Statement for the year.

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Nature of Work	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	Poisons																			
						Inorganic										Organic									
						Arsenious Oxide	Arsenious Oxide and Hypos	Arsenious Oxide, Hydrochloric Acid and Sulphuric Acid	Arsenious Oxide, Arsenic and Colloid	Arsenious Oxide and Morphine	Arsenious Oxide and Camphor	Arsenious Oxide, impure Opium and Colloid	Mercuric Salt	Opium	Bayle glass powder	Arsenious Oxide, Hypos and Opium	Opium	Opium	Opium	Opium	Opium	Opium	Opium	Opium	Opium
Human cases																									
Class A	92	551	66	-	-	40	-	-	-	1	1	1	9	-	-	1	-	-	-	2	-	2	3	3	-
Class B	24	58	10	-	-	3	-	-	1	-	-	-	2	-	-	1	-	-	1	-	-	-	-	-	-
Blood Stains	33	99	-	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Seminal Stains	3	5	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cattle Cases																									
Class A	34	129	26	-	-	24	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Class B	20	22	19	-	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Examinations for Govt Dept	855	855	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
For private parties, Hums &c	30	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total for the year 1890	1091	1749	121	27	1	86	1	-	1	1	1	1	11	-	-	1	-	-	3	-	3	3	3	-	-
" " 1889	1039	1689	138	19	-	75	1	1	3	-	-	-	10	3	1	1	1	1	5	1	7	4	2	2	1

I have the honor to be

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Sir

Your most obedient servant

W. Wainwright

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

Chemical Examiner

113 1891
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From

The Chemical Examiner
Madras

The Chief Secretary
to Government
Public Department

No. 219.

Dated 12 } March 1891.
Received

Enclosure

Subject

Submitting Annual Report
of the Chemical Examiner
Department for the year 1890.

L. Public 834/91

11th May

354-54

APRIL 1891, No. , PUBLIC.

GOVERNMENT OF MADRAS.
PUBLIC DEPARTMENT.

READ—the following paper :—

From W. F. DEFABECK, Esq., M.D., Surgeon-General with the Government of Madras, to the Chief Secretary to Government, dated Nungambaukam, 19th March 1891, No. 232.

I have the honor to forward herewith the annual report of the Chemical Examiner for 1890, which, like that of 1889, is both interesting and valuable.

2. There was a slight decrease in the number of medico-legal examinations conducted during the year, but the miscellaneous chemical analyses increased from 804 in 1889 to 885 in 1890.

3. I would draw the attention of Government to paragraph 29 of the report, in which the Chemical Examiner expresses a hope that results of legal trials will be attached to the records of every criminal case that in future comes under investigation in his department.

ENCLOSURE.

From J. L. VANGEYZEL, Esq., M.B., C.M., F.C.S., F.I.C., Chemical Examiner, Madras, to the Chief Secretary to Government, dated Madras, 12th March 1891, No. 219.

I have the honor to submit the annual report on the work of the Chemical Department for the year 1890.

2. The number of medico-legal examinations was less than in the previous year by 29 cases, though the difference in the actual number of analyses performed in this section was only 21, viz., 864 against 885 in 1889, which was an exceptionally busy year. The miscellaneous chemical analyses during 1889, which had exceeded the work done in any previous year, has been exceeded in the year under review by 81 analyses. These facts are demonstrated by the table of figures given below :—

TABLE No. I.

		Number of Cases.		Number of Articles received for examination.	
		1890.	1889.	1890.	1889.
Medico-legal	I. Suspected poisoning (human)	116	136	609	607
	II. " blood stains, &c.	33	29	99	84
	III. " seminal stains	3	2	5	3
	IV. " poisoning of cattle	54	68	151	
Miscellaneous	For Government departments, Municipalities and private parties	885	804	885	804
Total ..		1,091	1,039	1,749	1,689

MEDICO-LEGAL SECTION.

I.—CASES OF SUSPECTED POISONING (HUMAN).

3. Though the number of cases in which chemico-legal analyses were required was fewer than in the previous year, the number of analyses performed was practically the same, viz., 609 against 607 in 1889. The percentage of detections in 1889 suddenly rose by 9 per cent. over any previous year's record, in spite of the fact that the work of that year was unusually heavy, and this high percentage (the result of improved methods of work and of the unceasing patience and willingness with which the Assistant Chemical Examiner and the other assistants generally carry out instructions) has been closely maintained during 1890 also. Out of 116 cases which came under investigation, poison was detected in 76, or in 65.52 per cent. of the cases against 66.18 per cent. in the previous year. Information regarding these cases is given as usual in the two following tabular statements :—

TABLE II.—Human Cases—Class A.

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

Districts received from.	Poisons.														
	Inorganic.														
	7	8	9	10	11	12	13	14	15	16					
	Arsenious Oxide.	Arsenious Oxide and Realgar.	Arsenious Oxide, Hydrochloric Acid and Sulphuric Acid.	Arsenious Oxide and Mercuric Salt.	Arsenious Oxide and Atropine.	Arsenious Oxide and Plumbagin.	Arsenious Oxide, Impure Orpiment and Calomel.	Mercuric Salt.	Orpiment.	Bangle-glass Powder.					
	Number of cases.	Number of cases in which poison was detected.	Number of individuals affected.	Number of deaths.	Number of analyses.										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Anantapur	3	2	3	2	18	2	..	..	..	..	..	..	..	..	..
Arcoot, North	4	6	19	4	30	3	..	..	..	..	..	..	..	..	..
Arcoot, South	8	6	17	4	39	3	..	..	..	..	..	..	..	..	..
Bellary	3	3	5	3	15	3	..	..	..	..	..	..	..	..	..
Canara, South	3	2	3	3	15	..	..	..	..	..	..	..	..	..	..
Coimbatore	3	2	3	3	28	2	..	..	..	..	..	..	..	..	..
Cuddapah	3	1	4	2	11	1	..	..	..	..	..	..	..	..	..
Ganjam	7	5	18	12	38	2	..	..	..	..	..	..	..	..	..
Godavari	9	6	10	8	70	2	..	..	..	..	..	..	..	..	..
Kistna	10	8	18	5	61	3	..	..	..	..	..	..	..	..	..
Kurnool	2	..	2	1	5	..	..	..	..	..	..	..	..	..	..
Madras	3	1	9	1	16	1	..	..	..	..	..	..	..	..	..
Madura	4	2	12	3	19	1	..	..	..	..	..	..	..	..	..
Nellore	9	9	12	5	48	4	..	..	..	..	..	..	..	..	..
Salem	3	2	21	1	17	1	..	..	..	..	..	..	..	..	..
Tanjore	6	6	19	6	61	5	..	..	..	..	..	..	..	..	..
Trichinopoly	1	1	3	1	9	1	..	..	..	..	..	..	..	..	..
Tinnevely	7	1	8	2	30	3	..	..	..	..	..	..	..	..	..
Vizagapatam	3	4	9	2	20	3	..	..	..	..	..	..	..	..	..
Cochin	1	3	13	4	1	..	..	..	..	..	..	..	..	..	..
Total for 1890	92	66	201	71	551	40	1	1	3	1	1	1	8	1	1
" 1889	101	69	159	79	545	21	..	..	..	..	..	..	..	..	..

Human Cases—Class A.

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

Poisons—cont.																
Districts received from.	Organic.															
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	Picrotoxin.	Aconite and opium.	Abrus Precatorious.	Calotropis Gigantia.	Ganjah, Aconite and Gloriosa Superba.	Aconite.	Opium.	Datura.	Plumbagin.	Lebedieropsis "Odavan."	Datura and Ganjah.	Strychnine.	Atropine.	Ganjah.	Morphia.	Unidentified Poison.
Anantapur ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Arcoot, North ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Arcoot, South ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bellary ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Canara, South ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Coimbatore ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cuddapah ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ganjam ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Godavari ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kistna ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kurnool ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Madras ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Madura ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nellore ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Salem ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tanjore ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Trichinopoly ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tinnevely ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Vizagapatam ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cochin ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total for 1890 ..	1	1	1	2	1	2	3	3	2	1	1	2	1	4	3	1
" 1889 ..	..	..	..	2	..	7	3	2	..	..	..	3	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.	Arsenious Oxide, Mercuric Salt and Calomel.	Arsenious Oxide, Ganjah and Gloriosa Superba.	Opium.	Strychnine.	Calotropis Gigantea.	Ganjah.	Nux Vomica and Abrus Precatorius.	Opium.	Atropine.	Aconite.
Anantapur	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Arcoot, North	2	..	4	..	..	..	..	..	..	..	..	..	..	..	..
Arcoot, South	1	1	1	..	..	..	..	..	..	..	..	1	..	..	..
Bellary	3	..	3	..	..	..	..	..	..	..	..	..	..	..	..
Canara, South	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..
Chingleput	1	1	2	1	..	..	..	..	..	..	..	..	..	..	..
Coimbatore	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..
Ganjam	1	..	2	..	..	..	..	..	..	..	..	..	1	..	..
Kistna	2	2	11	..	..	1	..	..	..	..	..	..	..	..	1
Kurnool	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..
Madras	1	1	3	..	1	..	..	..	..	..	..	..	..	..	..
Malabar	1	1	7	..	..	..	1	..	..	..	..	..	..	..	..
Nellore	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Salem	2	1	4	1	..	..	..	..	..	..	..	..	..	..	..
Tanjore	2	2	3	1	1	..	..	..	..	..	..	..	..	..	..
Trichinopoly	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Tinnevely	2	..	5	..	..	..	..	..	..	..	..	..	..	..	..
Total for 1890	24	10	58	3	2	1	1	..	1	2	1	..	1	1	1
„ 1889	35	21	62	9	2	..	..	2	1	2	2	1	1	1	..

4. There were 40 cases of suspected poisoning in which the chemical examination failed to discover any poison, and which may be briefly noticed here. These cases fall into two groups, viz:—

Group I, consisting of 25 cases in which suspicious symptoms occurred, unattended by a fatal result; and

Group II, of 15 cases in which death occurred under suspicion of poisoning.

Group I.—In these cases miscellaneous articles found in a search, or excreta gathered from a dust heap, are the usual materials of which an examination for the discovery of poison is sought. In nearly every case under this group the suspicion of poisoning rested only on some strangeness in the taste or color of the food, or on vomiting after a meal, or on the mere statement of a selfish female that she had taken poison to put an end to herself.

Group II.—This group of 15 cases includes 19 deaths, and from a study of the information available regarding them, they may be disposed of as follow:—

(a) Cases in which the magisterial reports, *post-mortem* notes, &c., point to death from disease or injury, but in which a chemical investigation is sought in order to confirm or eliminate any suspicions due to other circumstances:—

	Deaths.
Fever	2
Cholera	1
Heart disease, bronchitis	3
Consequences of abortion	4
Total	10

(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 being the result of poisoning:

(1) A man fell dead during a fight, the wounds on his body were insufficient to account for death, and no internal cause of death could be made out at the *post-mortem* examination owing to advanced decomposition. In anticipation of the defence setting up the plea of death from poisoning, a chemical examination was advised.

(2) A man died after sudden vomiting and purging, and it was reported after burial that he met his death by violence. The body was exhumed, no evidence of violence was obtainable, and so the decomposed organs were sent to be examined for poison.

(3) A man who was under native treatment for old standing disease of testicle was in great agony, and his friends left him after nursing him through part of the night; the next morning he was missed, and his corpse was discovered in a neighbouring well. As the usual signs of drowning were absent at the *post-mortem* examination, a chemical examination was ordered.

(4) Owing to a family quarrel, husband and wife cooked their meals separately; an adopted child who used to share the father's meal suddenly took ill and died, and the mother absconded. At the *post-mortem* examination, the base of the skull was found fractured.

(c) The remaining case belongs to the class in which the balance of evidence appears to be in favor of death by poison, but in which no poison was detected. Husband, his brother, wife, and two children were reported to have suddenly taken ill and died in a Khond village in the Ganjam hill tracts. When the nearest apothecary arrived on the scene, two persons were dead, two more were found comatose and died in a short while, and the fifth was found "wandering about like a mad man; bawling out; his pupils were dilated, replies incoherent; he gradually became insensible and died." The *post-mortem* examination afforded no clue to the nature of the poison; and no further information of any kind was available, as the villagers had all taken fright and fled from the village.

5. In the 76 cases in which poison was detected, there were 54 deaths; in 59 of these cases, inorganic poisons were ascertained to be the cause of death, and organic poisons in the remaining 17.

6. *Inorganic Poisons*.—The following tabular statement affords the usual information regarding cases which have occurred from this class of poisons for five years:—

TABLE IV.

	1890.	1889.	1888.	1887.	1886.
Cases included in Class A	52	36	31	40	45
in Class B	7	13	10	11	13
Number of individuals affected in A and B	159	98	76	90	98
" of deaths in A and B	47	25	21	30	24

7. The physical properties of common white arsenic are all in favor of its easy administration; its action is rapid and certain; its effects strongly resemble a fatal disease which is of frequent occurrence in this country; it is procurable with the greatest ease in every bazaar; and so this substance continues to be the favorite weapon of the poisoner. In the face of evidence that death was the result of arsenic, with a strong presumption of guilt against an accused, the prosecution fails in many such cases for want of evidence to connect him with the poison. The necessity for restricting the sale of poisons, though recognised, has, I believe, been superseded by the difficulties in the way of applying any extended measures of restriction; but even a partial restriction, to the extent of limiting the power of selling to certain classes of shops and requiring the vendor to keep a simple register of sales of arsenic and mercurial compounds only, at first, might help the magistracy to trace these poisons to the possession of an accused with greater certainty than at present.

8. The following cases of *Arsenical poisoning* are worthy of brief reference:—

(a) A woman, having failed to obtain maintenance from her paramour, destroyed her child, the issue of their intimacy.

(b) A man took his wife to a neighbouring village to consult a native quack; immediately after eating a meal which her husband provided for her there, she was seized with vomiting and purging. She returned to her own village on foot next day, and it was sworn that in her weak state she was overpowered and strangled. The *post-mortem* examination did not take place for ten days and only traces of arsenic were found in the viscera, while half a grain of white arsenic was extracted from earth mixed with excreta.

(c) A man suffered from grinding pains in the stomach, vomiting and purging, for 23 hours and died, and was buried. The next day his niece also became ill with the same symptoms, having attempted suicide by eating some of the love medicines which she gave to her uncle at the instigation of another, who was her uncle's rival in adultery with her. The soiled clothes of the prisoner and the exhumed viscera of the deceased were found to contain arsenic, and she was sentenced to 18 months' rigorous imprisonment for causing death by a rash and negligent act.

(d) Two men quarrelled about water, which they shared in turns for irrigation, and the villagers interfered and settled the dispute. One of the parties not satisfied with the settlement took up a handful of dust, showed it to the sun and dropped it—a form of curse indulged in by Hindus during a quarrel—and declared that whoever was guilty of injustice would lose his son by next morning. The same afternoon, this man contrived to administer poisoned jaggery to the other man's son, who fortunately recovered under timely treatment in the dispensary. The vomited and purged matters contained arsenic; the purchase of jaggery that day by the accused was proved, and he was sentenced to 4 years' rigorous imprisonment for attempting to commit murder.

(e) In a fit of drunkenness, a man stabbed three of his neighbours, one of whom died instantly, and he chose for himself the agonies of death by arsenic.

(f) Eleven guests at a ceremony were seized with vomiting and purging after a meal, which the host abstained from eating, and two of them died.

(g) A woman lost some jewels from her house, and a reputed magician offered to recover them for a reward of Rs. 2. He gave her some sanctified rice to distribute among the neighbours, which, he said, would compel the thief to confess; but this ruse failed. He then prepared some balls which, he said, would give the thief a pain in the belly; and of the neighbours who came by invitation to witness the trick, twelve persons ate the balls which were distributed by him. One of these was soon after seized with the usual symptoms of arsenical poisoning and died. It appears that deceased was more strongly suspected than any one else of having stolen the jewels, which were mysteriously restored to the house of the owner during the night of his illness and death. The magician was sentenced to seven years' rigorous imprisonment for his successful performance.

(h) Two boys were given some jaggery by an old woman, and one of them immediately "vomited, went off to sleep and died in six hours;" the other fell asleep in fifteen minutes and died in five hours without any other symptoms. These are instances of an uncommon form of arsenical poisoning in which the nervous system becomes affected resulting in coma, like in opium poisoning, the absence of gastro-intestinal symptoms in the second boy is also noteworthy. Similar instances have been met with occasionally and noted in previous years' reports.

(i) A man visited another's paramour on the strength of a former intimacy with her, and she received him with favor. This led to a quarrel between the men, who vowed vengeance against each other, declaring that each would convert the other's "house-site into a field of castor oil plants," meaning extinction of the family; while the one engaged a man to work spells, the other stole a march on him by poisoning his son with an arsenical jaggery ball.

(j) In order to obtain money which was refused on loan, a man contrived to poison the food of thirteen persons and to be sent for to treat them for Rs. 4. His treachery was discovered, and he was sentenced to ten years' rigorous imprisonment.

(k) A woman T...e who had quarrelled with her paramour refused to return to him, but received the visits of another man. A friend with whom she was living suffered from purging, vomiting and sore eyes, all characteristic symptoms of over-dose of arsenic; and she herself suffered from similar symptoms and died; about the same time a neighbour also died. It seems that all three persons obtained water from the same well, and the paramour was suspected of having poisoned the well. There was no evidence against the accused and he was discharged; but arsenic was extracted from T...e's organs equal to three-fifths of a grain of white arsenic and also in about a pint of water taken from the well equal to one hundredth of a grain. The quantity found was very small, but the sample of water was not drawn for some days afterwards. In the judgment the insolubility of white arsenic in cold water is given as a reason against the possibility of deceased having been poisoned with arsenic through the well water, and this is done apparently on the authority of Taylor, though the latter admits that "cold water allowed to stand many hours on this poison will dissolve about half a grain of it in a fluid ounce." A case of well poisoning by arsenic is recorded in the annual report of this department for 1881-82, and the following occurred during the year under review:—

(l) Nineteen persons after drinking well water, in which two grains of white arsenic were found in six quarts full, suffered from vomiting, purging, and burning sensation in stomach without a fatal result.

9. *Compounds of Mercury* were found alone in eleven cases, and in two along with arsenical compounds. A few of these are noteworthy:—

(a) A theft occurred, and a magician with a reputation for detecting thefts was employed to discover the thief by sorcery. At a preliminary *seance*, at which rice was thrown on a winnow supported on the points of a pair of scissors, certain persons were suspected by the winnow shaking when they threw rice. At the next performance, the stolen property was to be restored; before a large crowd of people a hen was first whirled about over a diagram on the floor and caused to fall down dead; then an image was moulded out of flour and from it little balls were made and distributed to the suspected persons; one of these became violently ill in about fifteen minutes, lingered in pain for eighteen days from mercurial poisoning, and died. The magician was sentenced to three years' rigorous imprisonment.

(b) A woman was reported to have died after receiving a beating from her husband; but there were no marks of violence. The viscera sent contained mercury equal to one-fourth grain of corrosive sublimate.

(c) Six members of a family immediately after eating cakes made from mango seeds suffered from giddiness, vomiting, pains in the head and abdomen, and four of them died. Two of the corpses were burnt; but in the viscera of the other two was found mercury.

10. *Organic Poisons*.—This class of poisons was less resorted to during the year under review than in the two years immediately preceding it as will be seen from the following table:—

TABLE V.

	1890.	1889.	1888.	1887.	1886.
Cases included in Class A	14	33	20	9	5
" in Class B	3	8	12	2	11
Number of individuals affected in A and B	28	59	51	20	47
" of deaths in A and B	7	28	17	9	2

11. *Datura and Atropine* were detected in five cases alone and together with arsenic in a sixth case. In the three cases of atropine, no parts of the plant could be obtained and only a mydriatic alkaloid was extracted from the articles sent; which in the three cases returned under datura, some part of the plant was also available for identification.

(a) Two persons after eating a morning meal were affected with delirium, incessant talking, twitching of muscles, clutching at imaginary objects, fits of laughter, difficulty of swallowing, and dilatation of pupils. A magician who was sent for to discover the cause of these symptoms unwisely ate some of the food as an experiment and suffered similarly. In the meantime six other members of the family to whom food was sent out to the fields were found suffering in the same way, and one of them died.

(b) Two brothers-in-law put datura seeds into the curry of three women who were their neighbours with mischievous intent, and were sentenced to two months' rigorous imprisonment.

(c) A Bengali traveller joined a party of Muhammadans who had returned from Mauritius and were making their way down from Calcutta to Vizagapatam. On the way the Bengali contrived to poison his companions with datura, with the intention of robbing them, but he was foiled in his scheme. He was sentenced to seven years' rigorous imprisonment.

12. *Aconite and Opium* were found only in three cases each, against seven of each last year.

13. *Strychnine* was detected in two cases, in one of which a man was poisoned by a native quack who prescribed for stomach-ache; in the other the poison was apparently introduced into the food sent for examination and the man feigned symptoms which were inconsistent with strychnine poisoning, in order to intimidate a fractious wife.

14. *Juice of Calotropis Gigantea* was swallowed with fatal result by a woman on account of a quarrel with her husband.

15. *Plumbagin* was met with in one case only in which a widow died in consequence of procuring abortion by it.

16. *Picrotoxin*, the active principle of the *Cocculus Indicus*, was the cause of death in a woman who was suspected of having committed suicide. The substance which she used was subsequently sent for examination and identified as the berries of *Anamirta Cocculus*. Fatal human poisoning by *Cocculus Indicus* has very rarely been recorded, though it is a well-known fish poison and is used as such in civilised countries; and it has also been used in England for adulterating beer and porter to increase their intoxicating power. It is a compound poison, producing gastro-intestinal irritation with stimulation of the spinal cord, simulating in the latter respect the action of strychnine. The occurrence of convulsions, though common enough with the frog, does not appear to have been observed in the few cases of human poisoning by picrotoxin already recorded; and since Government called attention to my remarks regarding this poison in the annual report for 1887, careful enquiries have been made in cases which have come under notice. The original notes of the medical officer who observed the case under review record authentically that "twitchings and convulsions, with delirium," followed the stage of vomiting.

17. *Ganjah* was found in a "medicinal powder" in a case of criminal abortion; and also in some jaggery with which a man in revenge attempted to destroy his brother-in-law's child.

18. *Multiple Poisoning* occurred in 35 of the cases which were investigated, the largest number of persons affected and killed in a single case being five; the largest number of persons affected without a fatal result being nineteen in an arsenical case.

II.—BLOOD STAINS.

19. The following table furnishes the usual information regarding the examinations carried out in these cases:—

TABLE VI.—Blood Cases.

Districts received from.	Number of cases.	Number of cases in which blood was detected.	Number of examinations.
Anantapur	1	1	5
Arcot, North	2	1	4
Arcot, South	2	2	10
Chingleput	1	1	1
Coimbatore	4	4	11
Cuddapah	5	4	19
Kistna	1	1	18
Kurnool	2	2	3
Madura	4	3	10
Malabar	3	1	5
Nellore	2	2	3
Salem	2	1	4
Tanjore	1	1	1
Tinnevely	3	3	5
Total for the year 1890 ..	33	27	99
„ „ 1889 ..	29	19	84

20 Of twenty-seven cases in which the presence of blood was established, in thirteen mammalian blood was identified. In the case from Kistna district, mammalian blood was detected in seventeen out of the eighteen articles sent for examination. Twenty-four of the cases in which examinations for blood were performed related to the crime of murder, two to rape, two to homicidal wounds, one to suicide, and the cause of examination in four cases is unknown. The method of distinguishing human blood noted in last year's report requires further confirmation, and its application to medico-legal inquiries has not yet been satisfactorily established.

III.—SPERMATIC STAINS.

TABLE VII.

Districts received from.	Number of cases.	Number of cases in which semen was detected.	Number of examinations.
Coimbatore	1	..	2
Ganjam	1	..	1
Kistna	1	1	2
Total for the year 1890 ..	3	1	5
„ „ 1889 ..	2	..	3

21. Spermatozoa were detected in the Kistna case, but the crime of rape was not proved, neither was it proved in the Coimbatore case. The case from Ganjam was sodomy, in which the result of the enquiry has not been communicated.

IV.—CASES OF SUSPECTED CATTLE-POISONING.

22. A much larger number of cattle deaths was reported than has been the case in recent years, arsenical compounds, as usual, being almost invariably employed by the cattle-poisoner.

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 poisons.			Number of cases.	Number of cases in which poison was detected.	Number of analyses.	Nature of poisons.			
					Arsenious Oxide.	Calotropis Gigantea.	Arsenious Oxide and Realgar.				Arsenious Oxide.	Arsenious Oxide and Orpiment.	Ganjah.	
Anantapur	2	2	2	2	2	..	..	1	1	1	1	..	..	..
Arcot, North	..	..	..	..	..	..	..	1	1	1	1	..	..	..
Bellary	..	..	..	..	..	..	..	1	1	1	1	..	..	..
Chingleput	2	2	2	10	2	..	..	..	..	..	..	..	..	..
Cuddapah	7	29	6	17	6	..	..	1	1	1	1	..	..	..
Coimbatore	3	11	2	23	1	..	1	1	1	2	1	..	..	..
Godavari	..	..	4	25	4	..	..	3	3	3	3	..	..	..
Kistna	8	9	2	11	2	..	..	..	..	..	..	..	..	..
Kurnool	3	3	2	1	..	..	..	..	..	..	..	..	..	..
Madras	1	1	..	1	..	1	..	1	1	1	1	..	..	..
Madura	4	7	4	21	3	1	..	2	1	2	1	..	..	..
Malabar	..	..	2	8	2	..	..	..	..	..	..	..	..	..
Nellore	2	2	2	..	..	..	..	1	1	1	1	..	..	..
Salem	..	..	..	..	..	..	..	2	2	3	2	..	..	..
Tanjore	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Trichinopoly	1	1	1	4	1	..	..	4	4	4	4	..	..	..
Tinnevely	1	3	1	7	1	..	..	..	..	..	..	..	..	..
Vizagapatam	..	..	..	..	..	..	..	2	2	2	2	..	..	..
Total for 1890 ..	34	70	26	129	24	1	1	20	19	22	19	1	1	1
„ 1889 ..	43	53	28	153	27	1	..	25	20	38	18	..	..	..

It should be explained that the seven cases with twenty-nine deaths recorded in the Coimbatore district include a case of arsenical poisoning in which fourteen domestic fowls were found dead. The percentage of detections was 83.3 against 70.6 in the previous year.

MISCELLANEOUS SECTION.

23. The work under this heading shows no tendency to decrease or even to remain stationary; there were 885 analyses performed against 804 in the previous year, and of these thirty were for private parties and the remainder in the interests of various departments of Government.

EXAMINATIONS made for Government Departments, &c.

Received from	Nature of substance.	Number of examinations.	Total number of examinations for the year.
Board of Revenue	Salt	367	419
	Spirits	16	
	Malt liquor	22	
	“Wash”	2	
	Rectified Caoutchoucine	1	
	“Boja” liquor	1	
	Toddy	3	
	Ganjah Lakium	1	
	Myrrbane oil	1	
	Citronelle oil	1	
	Suspected substance	1	
	“Sonti”	2	
Chemical Laboratory, Madras	Pills	1	15
	Rain water	14	
	Well water	1	

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

Received from	Nature of substance.	Number of examinations.	Total number of examinations for the year.
Chemical Examiner, Mysore ..	Medicines	2	3
	Tannate of Copper ..	1	
Collector, South Arcot ..	Milk Punch	1	6
	"Eau de melisse des carmes" ..	1	
	"Eau de toilette" (Lubin) ..	1	
	Essence of Turpentine ..	1	
	"Eau de Rabel"	1	
	"Vin de Vial"	1	
Collector of Sea Customs ..	Methylated spirit	31	
	Kerosine oil	35	
	Cylinder oil	3	
	Rangoon oil	2	
Collector of Sea Customs ..	Engine oil	1	
	Lubricating oil	1	
	"Kainit"	1	
	Saw-dust packing	1	
	Dynamite	6	
	Blasting gelatine	3	
	Gelignite	3	
	Caoutchoucine	2	
	Malt liquor	7	
	Chloroform	1	
	Eau de Cologne	1	
	Perfumes	19	
	Dr. Pierce's Golden Medical Discovery	1	
		118	
Commissariat Department ..	Rum	4	
	Malt liquor	28	
	Carbolic powder	11	
	Æther	1	
	Ghee	2	
	Kerosine oil	6	
Director of Public Instruction ..	Sugar	2	54
District Magistrate, North Arcot ..	Water	1	1
District Medical Officer, Anantapur ..	Arrack	1	2
	Black powder	1	
Do. do. Bellary ..	Cholum	1	2
	Ragi	1	
Do. do. Calicut ..	Opium	1	1
Do. do. Madura ..	Opium	1	1
Do. do. Vellore ..	Opium	2	2
Do. do. Vellore ..	Opium	1	2
	Explosive mixture used for fireworks ..	1	
Do. do. Ganjam ..	Suspected intoxicants ..	10	10
	Water	4	
Deputy Surgeon-General, Her Majesty's Forces, Madras.			
Executive Engineer, Chingleput ..	Water	1	1
Do. do. Bangalore ..	Sand for filter bed ..	5	8
	Water	3	

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

Received from	Nature of substance.	Number of examinations.	Total number of examinations for the year.
Executive Engineer, Public Works Department, Hyderabad.	Water	10	10
Jail Department.	Superintendent, Jail, Párvatipur ..	Do.	1
	Do. do. Coimbatore ..	Do.	1
	Do. do. Berhampore ..	Do.	2
	Do. do. Trichinopoly ..	Do.	1
	Medical officer, Her Majesty's Penitentiary.	Do.	8
	Medical officer, Jail, Rajahmundry.	Do.	2
	Do. do. Vellore ..	Do.	3
	District Medical officer, Ganjam, from Jail at Aska.	Do.	1
			19
Magistrate, 2nd class, Ramnad ..	Toddy	4	4
Do. 3rd class, Palni	Ganjah	1	1
Medical officer, Alur	Substances used by alchemist.	3	3
Do. do. Tiruchendúr	Substance suspected to have caused village fire.	1	1
Municipalities.	Madras	Water	24
	Do.	Sonti	1
	Salem	Water	9
	Kurnool	Do.	2
	Ootacamund	Do.	8
	Nandyál	Do.	2
	Ványambádi	Do.	6
	Coonoor	Do.	4
	Chidambaram	Do.	4
	Negapatam	Do.	4
	Cuddapah	Do.	2
	Dindigul	Do.	5
	Adóni	Do.	2
	Madura	Do.	5
Ordnance Officer, Arsenal, Madras ..	Bar soap	1	3
	Rangoon oil	2	
Principal Medical Storekeeper, Madras.	Dilute Hydrocyanic Acid ..	5	8
	Quinine Sulphate	1	
Principal Medical Officer, Her Majesty's Forces, in Madras.	Water	1	8
	Opium refuse	1	
Superintendent of Stationery, Madras.	Brandy	2	6
	Port wine	2	
Senior Medical Officer, General Hospital.	Sherry	2	28
	Inks	28	
Surgeon (Second), General Hospital ..	Medicated cotton wool ..	1	4
Do. (Resident) do. do. ..	Whiskey	1	
Surgeon to His Excellency the Governor.	Urine	1	1
	Quinine mixture	1	
Sub-Assistant Superintendent, Telegraph Stores.	Water	1	1
Sub-divisional Officer, Tiruvallur ..	Bichromate of Potash ..	2	2
Superintendent, Central Museum, Madras.	Water	1	1
	Plumbago	1	
Villupuram-Guntakal State Railway ..	Iron ore	1	2
	Water	35	
Private Parties and Firms	Water	4	35
	Soil	3	
	Ink	3	
	Skins	4	
	Cinchona bark	3	
	Crude Saltpetre	1	
	Kerosine oil	2	

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

Received from	Nature of substance.	Number of examinations.	Total number of examinations for the year.
Private Parties and Firms— <i>cont.</i>	Bees-wax	1	30
	Gold thread	1	
	Goat hair	1	
	Quartz	1	
	Alizarine	2	
	Ale	1	
	Ground-nut seeds	1	
	Hongay seeds	1	
	Castor-oil seeds	1	
	Total	885	885

24. *Waters.*—The work of examining waters has increased very much, especially on account of municipalities, and applications for analyses from local bodies have been more numerous than could be complied with without dislocating more important work, and I have been obliged in some cases to disappoint applicants. Since Government disallowed the privilege, held so long by the Chemical Examiner, of charging the authorised fees for work done on behalf of municipalities, such work has increased over four-fold. Work of this nature can only be performed in the intervals of more important medico-legal examinations, which take precedence of all other work, but the flow of miscellaneous work is so uncertain that it is impossible to know what and how much to undertake, or to regulate it in any other way, for arrangements made in anticipation are almost invariably upset by sudden inflow of medico-legal work, and hence the Medical Examiner is obliged to take everything that comes. Under these circumstances, I beg that Government may now be pleased to restore the former relations of the Chemical Examiner to local bodies—relations which in the case of the Bombay and Calcutta Examiners have not been disturbed—or to place some other restriction upon the power of municipalities to call upon the Chemical Examiner to undertake analysis for them. One municipality forwarded a resolution requiring the Chemical Examiner to undertake (at the suggestion of their District Medical Officer) a regular periodical analysis of the whole of the potable waters in their town, and this is only one of several similar cases. I have done my best to meet the most pressing needs in such cases as far as possible, but it is difficult to carry on the work with any prospect of meeting such requisitions in a satisfactory way.

In addition to 123 samples of water examined for potability, on behalf of municipalities, of the Jail, and various other departments of Government, thirty-five samples of water were also examined as to their potability and fitness for use in locomotive boilers on account of the Villupuram-Guntakal State Railway. There were also examined fourteen samples of rain water in continuation of the examinations begun three years ago, chiefly to estimate the nitrogen brought down by rain, and the condensed results are given below:—

ANALYSES of Madras Rain-water—Monthly Results, 1890.

	June.	July.	August.	September.	October.	November.	December.	Total.
Rainfall Inches.	8.87	7.56	1.62	2.42	5.26	4.49	0.86	26.08
Total combined Nitrogen (as N. H. 3) lb. per acre.	0.448	0.476	0.186	0.122	0.372	0.369	0.105	2.078
Chlorine (as Na cl.)	6.305	7.736	2.740	2.619	5.283	5.110	1.435	31.228
Solids	15.292	17.102	9.162	8.968	15.575	20.315	4.863	91.267
Ash	9.646	8.551	5.497	2.986	5.949	10.157	1.945	44.731

The assimilation of free nitrogen by plants, directly from the atmosphere, as opposed to the view that the source of plant nitrogen is to be sought in the soil and not in the air, has recently assumed a fresh aspect from results of experiments which are being carried on at Rothamsted. So far it appears as if the large amount of nitrogen contained in leguminous

plants may be derived from the free nitrogen of the air being brought into combination under the influence of micro-organisms. The addition of a watery extract of soil, containing the appropriate organism, to a sterilized soil growing leguminous plants, was followed by increased growth and gain of nitrogen.

25. *Customs Work.*—One hundred and eighteen examinations were made on behalf of the Collector of Sea Customs chiefly with reference to duty leviable on alcohol in the case of substances whose spirit strength cannot be gauged in the usual way. Of thirty-one samples of methylated spirit sent for examination, twenty-six passed as being "sufficiently methylated" according to the orders of Government, and five were rejected. There were also thirty-five examinations performed under the Petroleum Act and twelve under the Explosives Act without any rejections.

26. *Salt.*—Three hundred and sixty-seven samples were analysed during the year, being a larger number than usual.

27. *Ergotism.*—A widespread attack of this form of poisoning occurred in some villages of the Penukonda taluk, and samples of the suspected grain (ragi and cholam) were sent for examination, with a full report of the outbreak and spread of the disease. Numbers of people suffered from burning sensation in the stomach, followed in a few days by vomiting and diarrhoea (which was in some cases bloody), cramps in the muscles of the abdomen and thighs, with loss of consciousness and death. In non-fatal cases, wasting of the muscles of the lower limbs with partial paralysis was a frequent sequela, and in a few cases mortification of the digits. It was roughly computed that 107 persons were attacked, and 30 died. The disease was also found to be confined to the poorer classes, who had readily purchased grain which was known to have been harvested early "on account of its being attacked by blight." On examining the grain in the house of the attacked people, Dr. Hackett Wilkins says that "some of it was found sprouting and the larger portion was black." The sample grain sent for examination was not so bad as this, and Mr. Lawson, the Government Botanist, who very kindly examined the grain, reported that both grains (ragi and cholam) had been harvested before "being fully matured; and there are on many of the grains patches of ergot, but in no case has the interior of the seed been attacked."

28. The Assistant Chemical Examiner and the other members of the department have performed their duties throughout the year with great care and zeal. The entries in the service books of those, for whom these registers are required to be kept, have been duly made and are up to date.

29. While infringements of the rules relating to packing and testing of spirit for copper have been reduced to a minimum, disregard of the orders relating to the results of trials in criminal cases, in which chemical examination is sought, is still frequent, though there has been a marked improvement in this respect during the year. It is hoped that it will be possible to render complete the records of every criminal case that in future comes under investigation in this department, by having the result of the legal trial also; as without it these records lose a great deal of their scientific value.

30. The usual statement embodying the statistics shown in the body of the report is appended.

Order 4th May 1911 No 354

The analytical work done by the Chemical Examiner in ¹⁸⁹⁰ is compared below with that performed in 1889:-

	Number of Cases investigated		Number of Articles Examined		of
	1890	1889	1890	1889	
<u>A. — Medico-legal Investigations.</u>					
Cases of suspected human poisoning .. " ..	116	136	609	607	three
" " Cattle poisoning " " "	54	60	151	191	rd
Blood Stains, &c. " " " "	53	29	99	84	two
Seminal Stains " " " "	3	2	5	3	
Total ..	206	235	864	885	6
<u>B. — Miscellaneous Analyses</u>					
For Government Departments & Municipalities	855	770	855	770	low
" Private parties and firms " " "	30	34	30	34	ations
Total ..	885	804	885	804	cases
Grand Total ..	1091	1039	1749	1689	non

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

Year	A Cases in which viscera or excretions were examined			B Cases in which only suspected food, &c., was processed for examination			Total		
	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
1889	101	69	68.32	35	21	60	136	90	66.18
1890	92	66	71.74	24	10	41.6	116	76	65.52

3. Of the 76 cases in which poison was detected inorganic poisons were found in 59 and organic poisons in 17. The annexed table shows that during the year under review, there were ten more cases in which inorganic poisons were used than in 1889 and the total number of cases was greater than it was in any of the four preceding years. ~~arsenic was, as usual, more largely used than any other poison.~~

Year	Number of cases detected	Inorganic poison	Organic poison	Percentage of Column 3 to Column 2.
1	2	3	4	5
1890	76	59	17	77.63
1889	90	49	41	54.4
1888	73	41	32	56.2
1887	62	51	11	82.3
1886	74	58	16	78.4

4. The total number of ascertained deaths from the effects of poison was 54 or 1 more than in 1889, and 16 more than in 1888. Forty seven deaths were due to inorganic and seven to organic poisons as against 25 and 20 - the corresponding figures for 1889.

5. Cases of suspected Cattle Poisoning - The number of cases examined was 54 or 14 less than in 1889. Poison was detected in 45 cases and arsenic was the ~~most~~ ^{most} ~~common~~ ^{common} ~~poison~~ ^{poison} in no less than 43 of these. The percentage of detections rose from 70.6 in 1889 to 83.3 in 1890.

6. Blood Stains - Thirty three cases were examined and blood was ~~detected~~ ^{detected} in 27. In the year under review, 99 examinations of 93 cases resulted in blood being found in 27 ~~cases~~ ^{instances}, while in the preceding year 84 examinations in 29 cases showed blood in 19 cases.

7. Spermatocyst Stains - Three cases were examined and semen was detected in one.

8. Miscellaneous Analyses - The principal work under this head was the examination of Salt (367 examinations) for the Board of Revenue; of Kerosine Oil (35 examinations) & methylated spirit (31 examinations) for the Collector of Sea Customs; of malt liquor (20 examinations) for the Commissioners.

Department; and of water for Gosh
Municipalities and private parties
(172 examinations)

9. The report will be communicated to the Judicial Department with reference to ^{the} remarks in paras

~~7 and 29, and a letter^{written} from him dated
Sept. 10 of G. O. No. 359, dated
with exponents.~~

~~44th May 1890. Paragraph 24 will~~
~~the fact that my letter regarding~~
~~the death is written in the Local~~
~~insert to notify the order which~~
~~under Township & Department~~
~~some have been changed in regard to the Commission~~

10. The Government considers the report satisfactory and ^{with pleasure} the testimony of the Chemical Examiner will ^{be requested to} ~~in future~~ furnish ^{in future} statements similar to those embodied in this order.

St
1/2 in. away

903.
30/4.

addresses same as J. A. No. 359 of
14 May 70, but add C. & C. Dept.

Ende 1891/92 No. 355

Copy to the Govt: of India,
Home Dept.

Political Prisoners
Report 1990.

see in para 28 of the report to the case
a list of the A. C. I. & other
members of the staff.

Dec 13/91
The Judicial Department. 1
" Surgeon General with the Govt. of Madras 6
" Chemical Examiner 6
" Sanitary Commissioner for Madras 6
" Revenue Department. 7
" Local and Municipal Department. 6
" Military Department. 6
" Inspector General of Police 6
all District Magistrates. 17
The Secretary to the Government of Hongkong
wrote L.

Pub. Exp. No. 354/55
of 4th May 1891.

~~The Collectors of~~
The District Magistrates of

Sept 12/5/91.

- Anantapur. 8
North Arcot, Chittoor. 8
South Arcot, Cuddalore. 8
Bellary. 8
South Canara, Mangalore. 8
Chingleput, Saidapet. 8
Coimbatore. 8
Cuddapah. 8
Ganjam, Chatrapur. 8
Godavari, Cocanada. 8
Kistna, Masulipatam. 8
Kurnool. 8
Madras (when necessary).
Madura. 8
Malabar, Calicut. 10
Nilgiris, Ootacamund. 8
Nellore. 8
Salem. 8
Tanjore. 8
Tinnevely. 8
Trichinopoly. 8
Vizagapatam. 8

4TH MAY 1891, Nos. 354, 355, PUBLIC.

GOVERNMENT OF MADRAS.

PUBLIC DEPARTMENT.

READ—the following paper :—

From W. F. DEFABECK, Esq., M.D., Surgeon-General with the Government of Madras, to the Chief Secretary to Government, dated Nungambaukam, 19th March 1891, No. 232.

I have the honor to forward herewith the annual report of the Chemical Examiner for 1890, which, like that of 1889, is both interesting and valuable.

2. There was a slight decrease in the number of medico-legal examinations conducted during the year, but the miscellaneous chemical analyses increased from 804 in 1889 to 885 in 1890.

3. I would draw the attention of Government to paragraph 29 of the report, in which the Chemical Examiner expresses a hope that results of legal trials will be attached to the records of every criminal case that in future comes under investigation in his department.

ENCLOSURE.

From J. L. VANGHEYZEL, Esq., M.B., C.M., F.C.S., F.I.C., Chemical Examiner, Madras, to the Chief Secretary to Government, dated Madras, 12th March 1891, No. 219.

I have the honor to submit the annual report on the work of the Chemical Department for the year 1890.

2. The number of medico-legal examinations was less than in the previous year by 29 cases, though the difference in the actual number of analyses performed in this section was only 21, viz., 864 against 885 in 1889, which was an exceptionally busy year. The miscellaneous chemical analyses during 1889, which had exceeded the work done in any previous year, has been exceeded in the year under review by 81 analyses. These facts are demonstrated by the table of figures given below :—

TABLE No. I.

		Number of Cases.		Number of Articles received for examination.	
		1890.	1889.	1890.	1889.
Medico-legal	I. Suspected poisoning (human)	116	136	609	607
	II. " blood stains, &c.	33	29	99	84
	III. " seminal stains	3	2	5	3
	IV. " poisoning of cattle	54	68	151	191
Miscellaneous	For Government departments, Municipalities and private parties	885	804	885	804
Total ..		1,091	1,039	1,749	1,689

MEDICO-LEGAL SECTION.

I.—CASES OF SUSPECTED POISONING (HUMAN).

3. Though the number of cases in which chemico-legal analyses were required was fewer than in the previous year, the number of analyses performed was practically the same, viz., 609 against 607 in 1889. The percentage of detections in 1889 suddenly rose by 9 per cent. over any previous year's record, in spite of the fact that the work of that year was unusually heavy, and this high percentage (the result of improved methods of work and of the unceasing patience and willingness with which the Assistant Chemical Examiner and the other assistants generally carry out instructions) has been closely maintained during 1890 also. Out of 116 cases which came under investigation, poison was detected in 76, or in 65.52 per cent. of the cases against 66.18 per cent. in the previous year. Information regarding these cases is given as usual in the two following tabular statements :—

Districts received from.	Number of cases.	Number of cases in which poison was detected.	Number of individuals affected.	Number of deaths.	Number of analyses.	Inorganic.									Poisons.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
						Arsenious Oxide.	Arsenious Oxide and Realgar.	Arsenious Oxide, Hydrochloric Acid and Sulphuric Acid.	Arsenious Oxide and Mercurio Salt.	Arsenious Oxide and Atropine.	Arsenious Oxide and Plumbagin.	Arsenious Oxide, Impure Orpiment and Colomel.	Mercuric Salt.	Orpiment.	Bangle-glass Powder.
Anantapur ..	3	2	3	2	18	2	..	..	..	..	..	..	..	..	..
Arcoot, North ..	4	3	19	4	30	3	..	..	..	..	..	..	..	..	..
Arcoot, South ..	8	6	17	4	39	3	..	..	..	..	..	..	..	..	..
Bellary ..	3	3	5	3	15	3	..	..	..	..	..	..	..	..	..
Canara, South ..	3	2	3	3	15	..	..	..	..	..	..	..	..	..	..
Coimbatore ..	3	2	3	3	28	2	..	..	..	..	..	..	..	..	..
Cuddapah ..	3	1	4	2	11	1	..	..	..	..	..	..	..	..	..
Ganjam ..	7	5	18	12	38	2	..	..	..	..	..	..	..	..	..
Godavari ..	9	6	10	8	70	2	..	..	..	..	..	..	..	..	..
Kistna ..	10	8	18	5	61	3	..	..	..	..	..	..	..	..	..
Kurnool ..	2	1	2	1	5	..	..	..	..	..	..	..	..	..	..
Madras ..	3	1	9	1	16	..	..	..	..	..	..	..	..	..	..
Madrass ..	4	2	12	3	19	1	..	..	..	..	..	..	..	..	..
Nellore ..	3	6	21	5	48	4	..	..	..	..	..	..	..	..	..
Salem ..	3	3	17	1	17	1	..	..	..	..	..	..	..	..	..
Tanjore ..	6	6	19	6	61	5	..	..	..	..	..	..	..	..	..
Trichinopoly ..	1	1	3	1	9	1	..	..	..	..	..	..	..	..	..
Tinnevely ..	7	4	9	2	30	3	..	..	..	..	..	..	..	..	..
Vizagapatam ..	3	3	13	4	20	3	..	..	..	..	..	..	..	..	..
Cochin ..	1	..	1	1	1	..	..	..	..	..	..	..	..	..	..
Total for 1890 ..	92	66	201	71	551	40	..	..	..	1	1	1	9	..	..
" 1889 ..	101	69	159	79	545	21	..	..	..	..	..	..	8	..	..

Human Cases--Class A.

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

[illegible]

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.	Arsenious Oxide, Mercuric Salt and Calomel.	Arsenious Oxide, Ganjah and Gloriosa Superba.	Opium.	Strychnine.	Calotropis Gigantea.	Ganjah.	Nux Vomica and Abrus Precatorius.	Opium.	Atropine.	Aconite.
Anantapur	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Arcoot, North ..	2	..	4	..	..	..	..	..	..	..	..	..	..	..	..
Arcoot, South ..	1	1	1	..	..	..	..	..	..	..	1	..	..	..	..
Beilary	3	..	8	..	..	..	..	..	..	..	..	..	..	..	..
Canara, South ..	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..
Chingleput	1	1	2	1	..	..	..	..	..	..	..	..	..	1	..
Coimbatore	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..
Ganjam	1	..	2	..	..	1	..	..	..	..	..	..	..	..	1
Kistna	2	2	11	..	..	..	..	..	..	..	..	..	..	..	..
Kurnool	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..
Madras	1	1	3	..	1	..	..	..	..	..	..	..	..	..	..
Malabar	1	1	7	..	..	..	1	..	..	..	..	..	..	..	..
Nellore	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Salem	2	1	4	..	1	..	..	..	..	..	..	..	..	..	..
Tanjore	2	2	3	1	1	..	..	..	..	..	..	..	..	..	..
Trichinopoly ..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Tinnevely	2	..	5	..	..	..	..	..	..	..	..	..	..	..	..
Total for 1890 ..	24	10	58	3	2	1	1	2	1	2	1	1	1	1	1
" 1889	35	21	62	9	2	..	..	..	1	2	2	1	1	1	..

4. There were 40 cases of suspected poisoning in which the chemical examination failed to discover any poison, and which may be briefly noticed here. These cases fall into two groups, viz:—

Group I, consisting of 25 cases in which suspicious symptoms occurred, unattended by a fatal result; and

Group II, of 15 cases in which death occurred under suspicion of poisoning.

Group I.—In these cases miscellaneous articles found in a search, or excreta gathered from a dust heap, are the usual materials of which an examination for the discovery of poison is sought. In nearly every case under this group the suspicion of poisoning rested only on some strangeness in the taste or color of the food, or on vomiting after a meal, or on the mere statement of a selfish female that she had taken poison to put an end to herself.

Group II.—This group of 15 cases includes 19 deaths, and from a study of the information available regarding them, they may be disposed of as follow:—

(a) Cases in which the magisterial reports, *post-mortem* notes, &c., point to death from disease or injury, but in which a chemical investigation is sought in order to confirm or eliminate any suspicious due to other circumstances:—

	Deaths.
Fever	2
Cholera	1
Heart disease, bronchitis	3
Consequences of abortion	4
Total	10

(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 being the result of poisoning:

(1) A man fell dead during a fight, the wounds on his body were insufficient to account for death, and no internal cause of death could be made out at the *post-mortem* examination owing to advanced decomposition. In anticipation of the defence setting up the plea of death from poisoning, a chemical examination was advised.

(2) A man died after sudden vomiting and purging, and it was reported after burial that he met his death by violence. The body was exhumed, no evidence of violence was obtainable, and so the decomposed organs were sent to be examined for poison.

(3) A man who was under native treatment for old standing disease of testicle was in great agony, and his friends left him after nursing him through part of the night; the next morning he was missed, and his corpse was discovered in a neighbouring well. As the usual signs of drowning were absent at the *post-mortem* examination, a chemical examination was ordered.

(4) Owing to a family quarrel, husband and wife cooked their meals separately; an adopted child who used to share the father's meal suddenly took ill and died, and the mother absconded. At the *post-mortem* examination, the base of the skull was found fractured.

(c) The remaining case belongs to the class in which the balance of evidence appears to be in favor of death by poison, but in which no poison was detected. Husband, his brother, wife, and two children were reported to have suddenly taken ill and died in a Khond village in the Ganjam hill tracts. When the nearest apothecary arrived on the scene, two persons were dead, two more were found comatose and died in a short while, and the fifth was found "wandering about like a mad man, bawling out; his pupils were dilated, replies incoherent; he gradually became insensible and died." The *post-mortem* examination afforded no clue to the nature of the poison; and no further information of any kind was available, as the villagers had all taken fright and fled from the village.

5. In the 76 cases in which poison was detected, there were 54 deaths; in 59 of these cases, inorganic poisons were ascertained to be the cause of death, and organic poisons in the remaining 17.

6. *Inorganic Poisons*.—The following tabular statement affords the usual information regarding cases which have occurred from this class of poisons for five years:—

TABLE IV.

	1890.	1889.	1888.	1887.	1886.
Cases included in Class A	52	36	31	40	45
" in Class B	7	13	10	11	13
Number of individuals affected in A and B	159	98	76	90	98
" of deaths in A and B	47	25	21	30	24

7. The physical properties of common white arsenic are all in favor of its easy administration; its action is rapid and certain; its effects strongly resemble a fatal disease which is of frequent occurrence in this country; it is procurable with the greatest ease in every bazaar; and so this substance continues to be the favorite weapon of the poisoner. In the face of evidence that death was the result of arsenic, with a strong presumption of guilt against an accused, the prosecution fails in many such cases for want of evidence to connect him with the poison. The necessity for restricting the sale of poisons, though recognised, has, I believe, been superseded by the difficulties in the way of applying any extended measures of restriction; but even a partial restriction, to the extent of limiting the power of selling to certain classes of shops and requiring the vendor to keep a simple register of sales of arsenic and mercurial compounds only, at first, might help the magistracy to trace these poisons to the possession of an accused with greater certainty than at present.

8. The following cases of *Arsenical poisoning* are worthy of brief reference:—

(a) A woman, having failed to obtain maintenance from her paramour, destroyed her child, the issue of their intimacy.

(b) A man took his wife to a neighbouring village to consult a native quack; immediately after eating a meal which her husband provided for her there, she was seized with vomiting and purging. She returned to her own village on foot next day, and it was sworn that in her weak state she was overpowered and strangled. The *post-mortem* examination did not take place for ten days and only traces of arsenic were found in the viscera, while half a grain of white arsenic was extracted from earth mixed with excreta.

(c) A man suffered from grinding pains in the stomach, vomiting and purging, for 23 hours and died, and was buried. The next day his niece also became ill with the same symptoms, having attempted suicide by eating some of the love medicines which she gave to her uncle at the instigation of another, who was her uncle's rival in adultery with her. The soiled clothes of the prisoner and the exhumed viscera of the deceased were found to contain arsenic, and she was sentenced to 18 months' rigorous imprisonment for causing death by a rash and negligent act.

(d) Two men quarrelled about water, which they shared in turns for irrigation, and the villagers interfered and settled the dispute. One of the parties not satisfied with the settlement took up a handful of dust, showed it to the sun and dropped it—a form of curse indulged in by Hindus during a quarrel—and declared that whoever was guilty of injustice would lose his son by next morning. The same afternoon, this man contrived to administer poisoned jaggery to the other man's son, who fortunately recovered under timely treatment in the dispensary. The vomited and purged matters contained arsenic; the purchase of jaggery that day by the accused was proved, and he was sentenced to 4 years' rigorous imprisonment for attempting to commit murder.

(e) In a fit of drunkenness, a man stabbed three of his neighbours, one of whom died instantly, and he chose for himself the agonies of death by arsenic.

(f) Eleven guests at a ceremony were seized with vomiting and purging after a meal, which the host abstained from eating, and two of them died.

(g) A woman lost some jewels from her house, and a reputed magician offered to recover them for a reward of Rs. 2. He gave her some sanctified rice to distribute among the neighbours, which, he said, would compel the thief to confess; but this ruse failed. He then prepared some balls which, he said, would give the thief a pain in the belly; and of the neighbours who came by invitation to witness the trick, twelve persons ate the balls which were distributed by him. One of these was soon after seized with the usual symptoms of arsenical poisoning and died. It appears that deceased was more strongly suspected than any one else of having stolen the jewels, which were mysteriously restored to the house of the owner during the night of his illness and death. The magician was sentenced to seven years' rigorous imprisonment for his successful performance.

(h) Two boys were given some jaggery by an old woman, and one of them immediately "vomited, went off to sleep and died in six hours;" the other fell asleep in fifteen minutes and died in five hours without any other symptoms. These are instances of an uncommon form of arsenical poisoning in which the nervous system becomes affected resulting in coma, like in opium poisoning, the absence of gastro-intestinal symptoms in the second boy is also noteworthy. Similar instances have been met with occasionally and noted in previous years' reports.

(i) A man visited another's paramour on the strength of a former intimacy with her, and she received him with favor. This led to a quarrel between the men, who vowed vengeance against each other, declaring that each would convert the other's "house-site into a field of castor oil plants," meaning extinction of the family; while the one engaged a man to work spells, the other stole a march on him by poisoning his son with an arsenical jaggery ball.

(j) In order to obtain money which was refused on loan, a man contrived to poison the food of thirteen persons and to be sent for to treat them for Rs. 4. His treachery was discovered, and he was sentenced to ten years' rigorous imprisonment.

(k) A woman T...e who had quarrelled with her paramour refused to return to him, but received the visits of another man. A friend with whom she was living suffered from purging, vomiting and sore eyes, all characteristic symptoms of over-dose of arsenic; and she herself suffered from similar symptoms and died; about the same time a neighbour also died. It seems that all three persons obtained water from the same well, and the paramour was suspected of having poisoned the well. There was no evidence against the accused and he was discharged; but arsenic was extracted from T...e's organs equal to three-fifths of a grain of white arsenic and also in about a pint of water taken from the well equal to one hundredth of a grain. The quantity found was very small, but the sample of water was not drawn for some days afterwards. In the judgment the insolubility of white arsenic in cold water is given as a reason against the possibility of deceased having been poisoned with arsenic through the well water, and this is done apparently on the authority of Taylor, though the latter admits that "cold water allowed to stand many hours on this poison will dissolve about half a grain of it in a fluid ounce." A case of well poisoning by arsenic is recorded in the annual report of this department for 1881-82, and the following occurred during the year under review:—

(l) Nineteen persons after drinking well water, in which two grains of white arsenic were found in six quarts full, suffered from vomiting, purging, and burning sensation in stomach without a fatal result.

9. *Compounds of Mercury* were found alone in eleven cases, and in two along with arsenical compounds. A few of these are noteworthy:—

(a) A theft occurred, and a magician with a reputation for detecting thefts was employed to discover the thief by sorcery. At a preliminary *séance*, at which rice was thrown on a winnow supported on the points of a pair of scissors, certain persons were suspected by the winnow shaking when they threw rice. At the next performance, the stolen property was to be restored; before a large crowd of people a hen was first whirled about over a diagram on the floor and caused to fall down dead; then an image was moulded out of flour and from it little balls were made and distributed to the suspected persons; one of these became violently ill in about fifteen minutes, lingered in pain for eighteen days from mercurial poisoning, and died. The magician was sentenced to three years' rigorous imprisonment.

(b) A woman was reported to have died after receiving a beating from her husband; but there were no marks of violence. The viscera sent contained mercury equal to one-fourth grain of corrosive sublimate.

(c) Six members of a family immediately after eating cakes made from mango seeds suffered from giddiness, vomiting, pains in the head and abdomen, and four of them died. Two of the corpses were burnt; but in the viscera of the other two was found mercury.

10. *Organic Poisons*.—This class of poisons was less resorted to during the year under review than in the two years immediately preceding it as will be seen from the following table:—

TABLE V.

	1890.	1889.	1888.	1887.	1886.
Cases included in Class A	14	33	20	9	5
" in Class B	3	8	12	2	11
Number of individuals affected in A and B ..	28	59	51	20	47
" of deaths in A and B	7	28	17	9	2

11. *Datura and Atropine* were detected in five cases alone and together with arsenic in a sixth case. In the three cases of atropine, no parts of the plant could be obtained and only a mydriatic alkaloid was extracted from the articles sent; which in the three cases returned under datura, some part of the plant was also available for identification.

(a) Two persons after eating a morning meal were affected with delirium, incessant talking, twitching of muscles, clutching at imaginary objects, fits of laughter, difficulty of swallowing, and dilatation of pupils. A magician who was sent for to discover the cause of these symptoms unwisely ate some of the food as an experiment and suffered similarly. In the meantime six other members of the family to whom food was sent out to the fields were found suffering in the same way, and one of them died.

(b) Two brothers-in-law put datura seeds into the curry of three women who were their neighbours with mischievous intent, and were sentenced to two months' rigorous imprisonment.

(c) A Bengali traveller joined a party of Muhammadans who had returned from Mauritius and were making their way down from Calcutta to Vizagapatam. On the way the Bengali contrived to poison his companions with datura, with the intention of robbing them, but he was foiled in his scheme. He was sentenced to seven years' rigorous imprisonment.

12. *Aconite and Opium* were found only in three cases each, against seven of each last year.

13. *Strychnine* was detected in two cases, in one of which a man was poisoned by a native quack who prescribed for stomach-ache; in the other the poison was apparently introduced into the food sent for examination and the man feigned symptoms which were inconsistent with strychnine poisoning, in order to intimidate a fractious wife.

14. *Juice of Calotropis Gigantea* was swallowed with fatal result by a woman on account of a quarrel with her husband.

15. *Phumbagin* was met with in one case only in which a widow died in consequence of procuring abortion by it.

16. *Picrotoxin*, the active principle of the *Cocculus Indicus*, was the cause of death in a woman who was suspected of having committed suicide. The substance which she used was subsequently sent for examination and identified as the berries of *Anamirta Cocculus*. Fatal human poisoning by *Cocculus Indicus* has very rarely been recorded, though it is a well-known fish poison and is used as such in civilised countries; and it has also been used in England for adulterating beer and porter to increase their intoxicating power. It is a compound poison, producing gastro-intestinal irritation with stimulation of the spinal cord, simulating in the latter respect the action of strychnine. The occurrence of convulsions, though common enough with the frog, does not appear to have been observed in the few cases of human poisoning by picrotoxin already recorded; and since Government called attention to my remarks regarding this poison in the annual report for 1887, careful enquiries have been made in cases which have come under notice. The original notes of the medical officer who observed the case under review record authentically that "twitchings and convulsions, with delirium," followed the stage of vomiting.

17. *Ganjah* was found in a "medicinal powder" in a case of criminal abortion; and also in some jaggery with which a man in revenge attempted to destroy his brother-in-law's child.

18. *Multiple Poisoning* occurred in 35 of the cases which were investigated, the largest number of persons affected and killed in a single case being five; the largest number of persons affected without a fatal result being nineteen in an arsenical case.

II.—BLOOD STAINS.

19. The following table furnishes the usual information regarding the examinations carried out in these cases:—

TABLE VI.—Blood Cases.

Districts received from.	Number of cases.	Number of cases in which blood was detected.	Number of examinations.
Anantapur	1	1	5
Arcot, North	2	1	4
Arcot, South	2	2	10
Chingleput	1	1	1
Coimbatore	4	4	11
Cuddapah	5	4	19
Kistna	1	1	18
Kurnool	2	2	3
Madura	4	3	10
Malabar	3	1	5
Nellore	2	2	3
Salem	2	1	4
Tanjore	1	1	1
Tinnevely	3	3	5
Total for the year 1890 ..	33	27	99
„ „ 1889 ..	29	19	84

20. Of twenty-seven cases in which the presence of blood was established, in thirteen mammalian blood was identified. In the case from Kistna district, mammalian blood was detected in seventeen out of the eighteen articles sent for examination. Twenty-four of the cases in which examinations for blood were performed related to the crime of murder, two to rape, two to homicidal wounds, one to suicide, and the cause of examination in four cases is unknown. The method of distinguishing human blood noted in last year's report requires further confirmation, and its application to medico-legal inquiries has not yet been satisfactorily established.

III.—SPERMATIC STAINS.

TABLE VII.

Districts received from.	Number of cases.	Number of cases in which semen was detected.	Number of examinations.
Coimbatore	1	..	2
Ganjam	1	..	1
Kistna	1	1	2
Total for the year 1890 ..	3	1	5
„ „ 1889 ..	2	..	3

21. Spermatozoa were detected in the Kistna case, but the crime of rape was not proved, neither was it proved in the Coimbatore case. The case from Ganjam was sodomy, in which the result of the enquiry has not been communicated.

IV.—CASES OF SUSPECTED CATTLE-POISONING.

22. A much larger number of cattle deaths was reported than has been the case in recent years, arsenical compounds, as usual, being almost invariably employed by the cattle-poisoner.

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 poisons.			Number of cases.	Number of cases in which poison was detected.	Number of analyses.	Nature of poisons.			
					Arsenious Oxide.	Calatropis Gigantea.	Arsenious Oxide and Realgar.				Arsenious Oxide.	Arsenious Oxide and Orpiment.	Ganjam.	
Anantapur	2	2	2	2	2	..	..	1	1	1	1	..	..	..
Arcot, North	..	..	..	..	..	..	..	1	1	1	1	..	..	..
Bellary	..	..	..	..	..	..	..	1	1	1	1	..	..	..
Chingleput	..	2	2	10	2	..	..	..	..	..	1	1	..	..
Cuddapah	2	29	6	17	6	..	..	1	1	1	2	1	..	..
Coimbatore	7	11	2	23	1	..	1	1	1	3	3	3	..	..
Godavari	3	9	4	25	4	..	..	3	3	3	3	..	..	..
Kistna	8	3	2	11	2	..	..	..	..	..	..	..	..	..
Kurnool	3	3	2	11	2	..	..	..	..	..	..	..	..	..
Madras	1	1	..	1	..	..	..	1	1	1	1	1	..	..
Madura	4	7	1	21	3	1	..	2	1	2	1	..	..	..
Malabar	..	..	2	8	2	..	..	..	..	..	..	1	..	..
Nellore	2	2	2	..	..	..	..	1	1	1	1	..	..	..
Salem	..	..	..	..	..	..	..	2	2	3	2	..	..	..
Tanjore	..	..	..	..	..	..	..	4	4	4	4	..	..	..
Trichinopoly	1	1	1	4	1	..	..	..	..	..	..	..	..	..
Tinnevely	1	3	1	7	1	..	..	..	..	2	2	2	..	..
Vizagapatam	..	..	..	..	..	..	..	2	2	..	..	..	..	..
Total for 1890 ..	34	70	26	129	24	1	1	20	19	22	19	1	1	1
„ 1889 ..	43	53	28	153	27	1	..	25	20	38	18	..	..	..

It should be explained that the seven cases with twenty-nine deaths recorded in the Coimbatore district include a case of arsenical poisoning in which fourteen domestic fowls were found dead. The percentage of detections was 83.3 against 70.6 in the previous year.

MISCELLANEOUS SECTION.

23. The work under this heading shows no tendency to decrease or even to remain stationary; there were 885 analyses performed against 804 in the previous year, and of these thirty were for private parties and the remainder in the interests of various departments of Government.

EXAMINATIONS made for Government Departments, &c.

Received from	Nature of substance.	Number of examinations.	Total number of examinations for the year.
Board of Revenue	Salt	367	419
	Spirits	16	
	Malt liquor	22	
	“Wash”	2	
	Rectified Caoutchoucine	1	
	“Boja” liquor	1	
	Toddy	3	
	Ganjam Lakium	1	
	Myrrhane oil	1	
	Citronelle oil	1	
	Suspected substance	2	
	“Sonti”	1	
	Pills	1	
Chemical Laboratory, Madras	Rain water	14	15
	Well water	1	

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

Received from	Nature of substance.	Number of examinations.	Total number of examinations for the year.
Chemical Examiner, Mysore ..	Medicines	2	3
	Tannate of Copper ..	1	
Collector, South Arcot ..	Milk Punch	1	6
	"Eau de melisse des carmes" ..	1	
	"Eau de toilette" (Lubin) ..	1	
	Essence of Turpentine ..	1	
	"Eau de Rabel"	1	
Collector of Sea Customs ..	"Vin de Vial"	1	31
	Methylated spirit	31	
	Kerosine oil	35	
	Cylinder oil	3	
Collector of Sea Customs ..	Rangoon oil	2	118
	Engine oil	1	
	Lubricating oil	1	
	"Kainit"	1	
	Saw-dust packing	1	
	Dynamite	6	
	Blasting gelatine	3	
	Gelignite	3	
	Caoutchoucine	2	
	Malt liquor	7	
	Chloroform	1	
	Eau de Cologne	1	
	Perfumes	19	
	Dr. Pierce's Golden Medical Discovery	1	
Commissariat Department ..	Rum	4	54
	Malt liquor	28	
	Carbolic powder	11	
	Æther	1	
	Ghee	2	
	Kerosine oil	6	
Director of Public Instruction ..	Sugar	2	1
	Water	1	
District Magistrate, North Arcot ..	Arrack	1	2
	Black powder	1	
District Medical Officer, Anantapur ..	Cholum	1	2
	Ragi	1	
Do. do. Bellary ..	Opium	1	1
Do. do. Calicut ..	Opium	1	1
Do. do. Madura ..	Opium	2	2
Do. do. Vellore ..	Opium	1	2
	Explosive mixture used for fireworks ..	1	
Do. do. Ganjam ..	Suspected intoxicants ..	10	10
	Water	4	
Deputy Surgeon-General, Her Majesty's Forces, Madras.	Water	1	1
Executive Engineer, Chingleput ..	Sand for filter bed ..	5	8
Do. do. Bangalore ..	Water	3	

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

Received from	Nature of substance.	Number of examinations.	Total number of examinations for the year.
Executive Engineer, Public Works Department, Hyderabad.	Water	10	10
Jail Department.	Superintendent, Jail, Párvatipur ..	1	19
	Do. do. Coimbatore ..	1	
	Do. do. Berhampore ..	2	
	Do. do. Trichinopoly ..	1	
	Medical officer, Her Majesty's Penitentiary.	8	
	Medical officer, Jail, Rajahmundry.	2	
	Do. do. Vellore ..	3	
	District Medical officer, Ganjam, from Jail at Aska.	1	
Magistrate, 2nd class, Ramnad ..	Toddy	4	4
Do. 3rd class, Palni ..	Ganjah	1	1
Medical officer, Alur ..	Substances used by alchemist.	3	3
Do. do. Tiruchendúr ..	Substance suspected to have caused village fire.	1	1
Municipalities.	Water	24	78
	Madras	1	
	Do.	1	
	Salem	9	
	Water	2	
	Do.	8	
	Kurnool	2	
	Ootacamund	6	
	Nandyál	4	
	Vániyambádi	4	
	Coonoor	4	
	Chidambaram	4	
	Negapatam	2	
	Cuddapah	5	
Ordinance Officer, Arsenal, Madras ..	Dindigul	2	3
	Adóni	5	
Principal Medical Storekeeper, Madras.	Madura	1	8
	Bar soap	2	
Principal Medical Officer, Her Majesty's Forces, in Madras.	Rangoon oil	5	6
	Dilate Hydrocyanic Acid ..	1	
Superintendent of Stationery, Madras..	Quinine Sulphate	1	28
	Water	1	
Senior Medical Officer, General Hospital.	Opium refuse	1	8
	Brandy	2	
Surgeon (Second), General Hospital ..	Port wine	2	6
	Sherry	2	
Do. (Resident) do. do. ..	Inks	28	28
	Medicated cotton wool ..	1	
Surgeon to His Excellency the Governor.	Whiskey	1	4
	Urine	1	
Sub-Assistant Superintendent, Telegraph Stores.	Quinine mixture	1	1
	Water	1	
Sub-divisional Officer, Tiruvallur ..	Bichromate of Potash ..	2	2
	Water	1	
Superintendent, Central Museum, Madras.	Plumbago	1	1
	Iron ore	1	
Villupuram-Guntakal State Railway ..	Water	35	35
	Water	4	
Private Parties and Firms ..	Soil	3	2
	Ink	3	
	Skins	4	
	Cinchona bark	3	
	Crude Saltpetre	1	
	Kerosine oil	2	

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

Received from	Nature of substance.	Number of examinations.	Total number of examinations for the year.
Private Parties and Firms— <i>cont.</i>	Bees-wax	1	30
	Gold thread	1	
	Goat hair	1	
	Quartz	1	
	Alizarine	2	
	Ale	1	
	Ground-nut seeds	1	
	Hongay seeds	1	
	Castor-oil seeds	1	
	Total ..	885	885

24. *Waters.*—The work of examining waters has increased very much, especially on account of municipalities, and applications for analyses from local bodies have been more numerous than could be complied with without dislocating more important work, and I have been obliged in some cases to disappoint applicants. Since Government disallowed the privilege, held so long by the Chemical Examiner, of charging the authorised fees for work done on behalf of municipalities, such work has increased over four-fold. Work of this nature can only be performed in the intervals of more important medico-legal examinations, which take precedence of all other work, but the flow of miscellaneous work is so uncertain that it is impossible to know what and how much to undertake, or to regulate it in any other way, for arrangements made in anticipation are almost invariably upset by sudden inflow of medico-legal work, and hence the Medical Examiner is obliged to take everything that comes. Under these circumstances, I beg that Government may now be pleased to restore the former relations of the Chemical Examiner to local bodies—relations which in the case of the Bombay and Calcutta Examiners have not been disturbed—or to place some other restriction upon the power of municipalities to call upon the Chemical Examiner to undertake analysis for them. One municipality forwarded a resolution requiring the Chemical Examiner to undertake (at the suggestion of their District Medical Officer) a regular periodical analysis of the whole of the potable waters in their town, and this is only one of several similar cases. I have done my best to meet the most pressing needs in such cases as far as possible, but it is difficult to carry on the work with any prospect of meeting such requisitions in a satisfactory way.

In addition to 123 samples of water examined for potability, on behalf of municipalities, of the Jail, and various other departments of Government, thirty-five samples of water were also examined as to their potability and fitness for use in locomotive boilers on account of the Villupuram-Guntakal Railway. There were also examined fourteen samples of rain water in continuation of the examinations begun three years ago, chiefly to estimate the nitrogen brought down by rain, and the condensed results are given below:—

ANALYSES of Madras Rain-water—Monthly Results, 1890.

	June.	July.	August.	September.	October.	November.	December.	Total.
Rainfall Inches.	3.87	7.56	1.62	2.42	5.26	4.49	0.86	26.08
Total combined Nitrogen (as N. H. 3) lb. per acre.	0.448	0.476	0.186	0.122	0.372	0.369	0.105	2.078
Chlorine (as Na cl.)	6.305	7.736	2.740	2.619	5.283	5.110	1.435	31.228
Solids	15.292	17.102	9.162	8.958	15.575	20.315	4.863	91.267
Ash	9.646	8.551	5.497	2.986	5.949	10.157	1.945	44.731

The assimilation of free nitrogen by plants, directly from the atmosphere, as opposed to the view that the source of plant nitrogen is to be sought in the soil and not in the air, has recently assumed a fresh aspect from results of experiments which are being carried on at Rothamsted. So far it appears as if the large amount of nitrogen contained in leguminous

plants may be derived from the free nitrogen of the air being brought into combination under the influence of micro-organisms. The addition of a watery extract of soil, containing the appropriate organism, to a sterilized soil growing leguminous plants, was followed by increased growth and gain of nitrogen.

25. *Customs Work.*—One hundred and eighteen examinations were made on behalf of the Collector of Sea Customs chiefly with reference to duty leviable on alcohol in the case of substances whose spirit strength cannot be gauged in the usual way. Of thirty-one samples of methylated spirit sent for examination, twenty-six passed as being "sufficiently methylated" according to the orders of Government, and five were rejected. There were also thirty-five examinations performed under the Petroleum Act and twelve under the Explosives Act without any rejections.

26. *Salt.*—Three hundred and sixty-seven samples were analysed during the year, being a larger number than usual.

27. *Ergotism.*—A widespread attack of this form of poisoning occurred in some villages of the Penukonda taluk, and samples of the suspected grain (ragi and cholam) were sent for examination, with a full report of the outbreak and spread of the disease. Numbers of people suffered from burning sensation in the stomach, followed in a few days by vomiting and diarrhoea (which was in some cases bloody), cramps in the muscles of the abdomen and thighs, with loss of consciousness and death. In non-fatal cases, wasting of the muscles of the lower limbs with partial paralysis was a frequent sequela, and in a few cases mortification of the digits. It was roughly computed that 107 persons were attacked, and 30 died. The disease was also found to be confined to the poorer classes, who had readily purchased grain which was known to have been harvested early "on account of its being attacked by blight." On examining the grain in the house of the attacked people, Dr. Hackett Wilkins says that "some of it was found sprouting and the larger portion was black." The sample grain sent for examination was not so bad as this, and Mr. Lawson, the Government Botanist, who very kindly examined the grain, reported that both grains (ragi and cholam) had been harvested before "being fully matured; and there are on many of the grains patches of ergot, but in no case has the interior of the seed been attacked."

28. The Assistant Chemical Examiner and the other members of the department have performed their duties throughout the year with great care and zeal. The entries in the service books of those, for whom these registers are required to be kept, have been duly made and are up to date.

29. While infringements of the rules relating to packing and testing of spirit for copper have been reduced to a minimum, disregard of the orders relating to the results of trials in criminal cases, in which chemical examination is sought, is still frequent, though there has been a marked improvement in this respect during the year. It is hoped that it will be possible to render complete the records of every criminal case that in future comes under investigation in this department, by having the result of the legal trial also; as without it these records lose a great deal of their scientific value.

30. The usual statement embodying the statistics shown in the body of the report is appended.

IX.—Tabular Statement for the year.

Nature of work.	Poisons.																
	Inorganic.																
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	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 Realgar.	Arsenious Oxide, Hydrochloric Acid and Sulphuric Acid.	Arsenious Oxide, Mercuric Salt and Calomel.	Arsenious Oxide and Atropine.	Arsenious Oxide and Plumbagin.	Arsenious Oxide, impure Orpiment and Calomel.	Mercuric Salt.	Orpiment.	Bangle-glass Powder.	Arsenious Oxide, Ganjah and Chloriosa Superba.	Arsenious Oxide and Orpiment.
1																	
Human cases { Class A ..	92	551	66	..	..	40	..	..	..	1	1	1	9	..	..	..	..
" B ..	24	58	10	..	..	3	..	..	..	..	..	..	2	..	..	..	..
Blood stains ..	33	99	..	27	..	..	..	..	..	..	..	..	..	..	..	..	..
Seminal stains ..	3	5	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Cattle cases { Class A ..	34	129	26	..	..	24	1	..	..	..	..	..	..	..	..	..	..
" B ..	20	22	19	..	..	19	..	..	..	..	..	..	..	..	..	..	..
Examinations for Government departments ..	855	855	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
For private parties, firms, &c. ..	30	30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total for the year 1890 ..	1,091	1,749	121	27	1	86	1	1	3	1	1	1	11	3	1	1	1
" " 1889 ..	1,039	1,689	138	19	..	75	..	..	..	..	..	..	10	..	..	..	..

Total number of cases in which semen was detected.

Total number of cases in which blood was detected.

Total number of cases in which poison was detected.

Total number of articles received for examination.

Total number of cases.

Tabular Statement for the year—cont.

Nature of Work.	Poisons—cont.																
	Organic.																Unidentified Poison.
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
	Picrotoxin.	Aconite and Opium.	Abrus Precatorius.	Calotropis Gigantea.	Ganjah, Aconite and Gloriosa Superba.	Aconite.	Opium.	Datura.	Plumbagin.	Lebediropis Orbicularis "Oduvan."	Datura and Ganjah.	Stychnine.	Atropine.	Ganjah.	Morphia.	Nux Vomica and Abrus Precatorius.	Unidentified Poison.
Human cases { Class A ..	1			2		2	3	3					1	1			
" B ..						1											
Blood stains ..																	
Seminal stains ..				1													
Cattle cases { Class A ..																	
" B ..																	
Examinations for Government departments ..																	
For private parties, firms, &c. ..																	
Total for the year 1890 ..	1	1	1	3	1	3	4	2	2	1	1	4	2	1	3	1	1
" " 1889 ..																	

Nature of Work.

Examinations for Government departments

For private parties, firms, &c.

Total for the year 1890

" " 1889

ORDER—dated 4th May 1891, No. 354, Public.

The analytical work done by the Chemical Examiner in 1890 is compared below with that performed in 1889 :—

	Number of cases investi- gated.		Number of articles examined.	
	1890.	1889.	1890.	1889.
<i>A.—Medico-legal Investigations.</i>				
Cases of suspected human poisoning	116	136	609	607
„ „ „ cattle do. „ „ „	54	68	151	191
Blood stains, &c. „ „ „	33	29	99	84
Seminal stains „ „ „	3	2	5	3
Total ..	206	235	864	885
<i>B.—Miscellaneous Analyses.</i>				
For Government Departments and Municipalities ..	855	770	855	770
„ Private parties and firms „ „ „	30	34	30	34
Total ..	885	804	885	804
Grand Total ..	1,091	1,039	1,749	1,689

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.
1889 ..	101	69	68.32	35	21	60	136	90	66.18
1890 ..	92	66	71.74	24	10	41.6	116	76	65.52

3. Of the 76 cases in which poison was detected, inorganic poisons were found in 59 and organic poisons in 17. The annexed table shows that, during the year under review, there were ten more cases in which inorganic poisons were used than in 1889, and the total number of cases was greater than it was in any of the four preceding years. Arsenic was, as usual, more largely employed than any other poison :—

Year.	Number of cases detected.	Inorganic poison.	Organic poison.	Percentage of column 3 to column 2.
1	2	3	4	5
1890	76	59	17	77.63
1889	90	49	41	64.4
1888	73	41	32	56.2
1887	62	51	11	82.3
1886	74	58	16	78.4

4. The total number of ascertained deaths from the effects of poison was 54, or 1 more than in 1889 and 16 more than in 1888. Forty-seven deaths were due to inorganic and seven to organic poisons, as against 25 and 28, the corresponding figures for 1889.

5. *Cases of suspected Cattle-poisoning.*—The number of cases examined was 54, or 14 less than in 1889. Poison was detected in 45 cases, and arsenic was the agent used in no less than 43 of these. The percentage of detections rose from 70.6 in 1889 to 83.3 in 1890.

6. *Blood Stains.*—Thirty-three cases were examined, and blood was detected in 27. In the year under review, 99 examinations of 33 cases resulted in blood being found in 27 instances, while in the preceding year 84 examinations in 29 cases showed blood in 19 cases.

7. *Spermatic Stains.*—Three cases were examined, and semen was detected in one.

8. *Miscellaneous Analyses.*—The principal work under this head was the examination of salt (367 examinations) for the Board of Revenue; of kerosine oil (35 examinations) and methylated spirit (31 examinations) for the Collector of Sea Customs; of malt liquor (28 examinations) for the Commissariat Department; and of water for Government Municipalities and private parties (172 examinations).

9. The report will be communicated to the Judicial Department, with reference to the remarks in paragraphs 7 and 29. With reference to paragraph 24, the Government does not see reason at present to modify the orders which have been issued in regard to the Chemical Examiner's fees.

10. The Government considers the report satisfactory, and notes with pleasure the testimony borne in paragraph 28 of the report to the care and zeal of the Assistant Chemical Examiner and other members of the staff. The Chemical Examiner will be requested to furnish, in future, statements similar to those embodied in this order.

(True Extract.)

J. F. PRICE,
Chief Secretary.

To the Judicial Department.
„ the Surgeon-General with the Government of Madras.
„ the Chemical Examiner.
„ the Sanitary Commissioner for Madras.
„ the Revenue Department.
„ the Local and Municipal Department.
„ the Military Department.
„ the Inspector-General of Police.
„ all District Magistrates.
„ the Secretary to the Government of Hongkong, with C.L.

ENDORSEMENT—dated 4th May 1891, No. 355, Public.

Copy to the Government of India, Home Department.

J. F. PRICE,
Chief Secretary.

Exd. A. Raitt.

Govt. of {1891} Madras.
PUBLIC.

Issued

Recd.

Encl.

G.O., &c., 4th May 1891,
Nos. 354, 355.

MAY.

Chemical Examiner's Report.

Reviewing the — for 1890, and forwarding
copy of proceedings to the Government of India.

HEAD QUARTERS ORDER OF GOVERNMENT, MADRAS
1891, No.

Enclosure

Commissary No.

per

GOVERNMENT OF MADRAS

Order, No. 354, of Government of Madras

ORDER OF GOVERNMENT OF MADRAS

ORDER OF GOVERNMENT OF MADRAS

ORDER OF GOVERNMENT OF MADRAS