

Public (1898) Department.

ORDINARY PRINTED.

G.O., No.<sup>s</sup> 369-70.

DATED 5. 3. 98.

INDEXED.

[Despatch Abstract.]

Chemico-legal examinations.

Forwarding [to the Govt of India] copy of a report from the Chemical Examiner Madras, on the proposal to substitute formaline for salt as a preservative of viscera, intended for transmission by post to the Chemical Examiner.

(For abstract - letter omit the portion bracketed)

# BACK PAPERS.

| G.O. | No. | Department. | Date. | G.O. | No. | Department. | Date. |
|------|-----|-------------|-------|------|-----|-------------|-------|
|      |     |             |       |      |     |             |       |

# FURTHER PAPERS.

| G.O.              | No. | Department. | Date. | G.O. | No. | Department. | Date. |
|-------------------|-----|-------------|-------|------|-----|-------------|-------|
| Cm. 2564/98(99-2) |     |             |       |      |     |             |       |

## Government (1898) of Madras. PUBLIC.

Recd.

Regd.

1898.

Enclosures

Spare copies

G.O., No. 369, 5th March 1898.

MARCH.

### Chemico-legal Examinations.

Forwarding to the Government of India copy of a report from the Chemical Examiner, Madras, on the proposal to substitute formaline for salt as a preservative of viscera, intended for transmission by post to the Chemical Examiner.

## GOVERNMENT OF MADRAS.

## PUBLIC DEPARTMENT.

Read—again the following paper :—

G.O., No. 1474, Public, dated 11th November 1897.

Read—also the following papers :—

From J. P. HEWETT, Esq., C.I.E., Secretary to the Government of India, Home Department (Medical), to the Chief Secretary to the Government of Madras, dated Simla, 30th October 1897, No. 1346.

I am directed to forward, for the information of the Madras Government, a copy of a letter from the Government of the North-Western Provinces and Oudh, No. 3100, dated the 23rd ultimo, giving cover to a copy of a letter from the Civil Surgeon of Sitapur and another from the Chemical Examiner and Bacteriologist, North-Western Provinces and Oudh and Central Provinces, recommending the substitution of formaline for salt as a preservative of *viscera* intended for transmission by post to the Chemical Examiner under the orders contained in this Department's Resolution No. 472—481, dated the 14th May last. I am to request that, with the permission of the Governor in Council, a report on the proposal may be obtained from the Chemical Examiner, Madras, and submitted for the information of the Government of India.

## ENCLOSURES.

From W. H. L. IMPEY, Esq., Secretary to the Government of the North-Western Provinces and Oudh, Judicial Department, to the Secretary to the Government of India, Home Department, dated Naini Tal, 23rd September 1897, No. 3100.

With reference to Home Department Resolution No. 472—481, dated the 14th May 1897,

1. Letter, No. 271-C., dated the 17th July 1897, from Surgeon-Major G. M. J. Giles, Civil Surgeon of Sitapur, to the Secretary to the Government of the North-Western Provinces and Oudh.
2. Letter, No. 510, dated the 23rd August 1897, from the Chemical Examiner and Bacteriologist, North-Western Provinces and Oudh and Central Provinces, to the address of the Inspector-General of Civil Hospitals, North-Western Provinces and Oudh.

regarding the transmission by post of packages containing human or other *viscera* for chemical examination, I am directed to submit, for the consideration and orders of His Excellency the Governor-General in Council, a copy of the papers marginally noted, regarding the quality of formaline as a preservative of *viscera* in comparison with common salt, the use of which is recommended in the rules issued with the Resolution quoted above.

From the Civil Surgeon of Sitapur, to the Secretary to the Government of the North-Western Provinces and Oudh, No. 271-C., dated 17th July 1897.

With reference to the Resolution No. 472—481 of the Government of India of 14th May 1897, containing rules in regard to the transmission by post of packages containing human or other *viscera* for chemical examination, I should be greatly obliged if you would ascertain from the Chemical Examiner if there is any objection to the use of formaline for preserving *viscera* sent to him for examination.

One or two minims to the ounce of material to be preserved if fluid or a solution of that strength in water for solid *viscera* is quite sufficient to thoroughly preserve organic matter of all descriptions and will absolutely stop decomposition.

As it is not poisonous it could hardly be confused with any suspected poison, and any European chemist could, I should say, easily distinguish it from alcohol apart from the fact that the quantity used is so small that the presence of an equal quantity of alcohol could raise no suspicion of alcoholic poisoning.

It must be remembered that *viscera*, &c., preserved for transmission to the Chemical Examiner have to be kept in the Civil Surgeon's office sometimes for months before permission is received to destroy them.

I have had large experience as Naturalist to the Marine Survey in the preservation of organic materials and at one time made many experiments with the view to discover some material cheaper than alcohol for preserving large masses, such as the *viscera* of cetaceans where the cost of alcohol is prohibitive. I naturally tried *inter alia* salt and I have no hesitation whatever in stating that the idea of preserving organic material whether in large or small pieces in a saturated solution of salt is, in this climate, absolutely futile and that a few cattle *viscera* so preserved would, by the time one obtained permission to destroy them, render the Civil Surgeon's office untenable.

It is a matter indeed of common experience that "corned beef" is an impossible luxury during the hot weather as the meat decomposes before it can "take salt."

In view of this well-known fact, how can it be expected that salt in any strength will preserve material which, in nine cases out of ten, is already in an advanced stage of decomposition.

Thirty drops of formaline costing half an anna or the price of half a pound of salt would, on the other hand, render the ordinary pickle bottle full of material sent to the Chemical Examiner quite inoffensive.

From the Chemical Examiner and Bacteriologist, North-Western Provinces and Oudh and Central Provinces, to the Inspector-General of Civil Hospitals, North-Western Provinces and Oudh, dated 23rd August 1897, No. 510.

With reference to your No. 6220, dated Lucknow, 14th August 1897, forwarding copy of a letter, No. 271-C., dated 17th July 1897, from the Civil Surgeon of Sitapur to the Secretary to the Government of the North-Western Provinces and Oudh, I have the honour to report as follows.

I entirely agree with the Civil Surgeon of Sitapur that common salt is absolutely useless as a preservative of *viscera*. It has no power whatever to stop decomposition which has once commenced, and in this country, in by far the greater number of cases, decomposition of *viscera* will have begun before preservation has been attempted. I have found that latterly since a saturated solution of common salt has been in use for the preservation of cattle *viscera*, that such *viscera* have arrived here in an advanced state of decomposition and extremely offensive. Salt when used to preserve organic tissues acts less by its own antiseptic power than by removing the brine the soluble and more putrescible organic constituents, and by hardening the remaining insoluble fibres. Salt is not a disinfectant and as a deodoriser I believe it to be useless. It has been shown by Bonley and Arloing, Cornevin and Thomas that even a saturated solution of salt has no action on the bacillus of anthrax. It is therefore an antiseptic of very low value. Moreover salt is objectionable as in making analyses it has to be got rid of and this is troublesome.

On the other hand formaldehyde or formaline is a very powerful antiseptic being actually superior to bichloride of mercury in this respect. It has also powerful deodorant properties.

Trillat states that "the addition of 1 to 50,000 to meat extract had a decided preservative action, while with 1 in 25,000 no change could be noticed in the extract after the lapse of four days. Mercuric chloride in these proportions has no effect, the extract showing change in 24 hours. With 1 in 12,000 the extract is kept good for several weeks, while change occurs in five days when using an equal weight of mercuric chloride. Several kinds of bacilli are destroyed by a solution of 1 in 25,000, such as that of *salina*." Trillat found that one hour's soaking in a 1 in 500 solution preserved meat for 25 days; five minutes with a 1 in 250 solution kept it for 20 days when exposed to air at 23°C to 30°C. Formaline unlike salt has the power of stopping decomposition which has commenced. It is non-poisonous. As it is a reducing agent I made some experiments with a view to ascertaining whether formaline had any reducing action on the vegetable poisons. Its action on morphine, atropine, strychnine, aconite and datura was investigated. It was found that formaline had no destructive action on any of these poisons, and in no way interfered with their detection either by chemical or physiological tests. Formaline is therefore unobjectionable as a preservative agent.

As regards expense, I see from Messrs. Kemp & Co.'s price list (August 1896) that formaline is priced at Re. 1 per ounce, but I daresay it could be obtained at a cheaper rate.

Taking into consideration, however, its extremely powerful antiseptic and deodorant properties enabling it to be used in every dilute solution, I do not think that the cost would be great. It is certainly infinitely superior to common salt in every way as a preservative of *viscera*.

Formaline exists only in solution and in a state of vapour. If condensed it polymerises to a white crystalline solid called paraformaldehyde. Formaline is readily soluble in water, giving, if perfectly pure, a neutral solution; commercially it is always slightly acid from the presence of a little formic acid. The odour is very pungent, irritating the eyes and nose. The aqueous solution is stable when kept in well-closed bottles, but loses some of the gas on exposure.

Endt., No. 2460, Public.

Referred to the Chemical Examiner for early report.

20th November 1897.

(Signed) M. E. COUCHMAN,  
Ag. Assistant Secretary.

From Surgeon-Major J. L. VANGEYZEL, M.B., F.I.C., F.C.S., Chemical Examiner,  
to the Chief Secretary to Government, dated Madras, 11th February 1898,  
No. 187.

With reference to endorsement, No. 2460, dated 20th November 1897, referring to me for early report a proposal to substitute formaline for salt as a preservative of *viscera* sent for chemical analysis, and with reference to reminder, dated 8th February 1898, I have the honour to state that the question was one which could be tested only by actual experiments and that these experiments were undertaken at once, and that time was an essential factor in testing the preservative qualities of the proposed agent. I regret therefore that my report could not be submitted earlier. Although the work undertaken has been scarcely completed, it is sufficiently advanced to enable me to express my opinion on the general question as to the advisability of adopting formaline as a preservative in chemico-legal cases.

2. In the first place, I would point out that the proposal as submitted is to substitute formaline for salt solution as a preservative of *viscera*. Salt solution was proposed, as a preservative of cattle *viscera* only, on a previous occasion, and the proposal appears to have been adopted in other parts of India. The experience of the Chemical Examiner, North-Western Provinces, recorded in the papers under reference, strengthens the objections which I raised to the use of salt solution as set forth in my report to Government \* No. 963, dated 12th October 1897. Salt solution has not been employed in this Presidency as a preservative at all. The question therefore resolves itself into formaline *versus* rectified spirit which is the preservative still employed in this Presidency.

3. As to the deodorising and preservative qualities of formaline there can be no question. In sufficient quantity its action in these respects is all that is desirable; but the strength of the solution to be employed has been understated. The Civil Surgeon of Sitapur says 1 or 2 minims of formaline to the ounce of water, and the Chemical Examiner, North-Western Provinces, quote Trillat who found 1 in 250 and 1 in 500 solutions effective. In a series of experiments which I have completed with cattle *viscera* to test this point, I found that 10 minims of formaline to the ounce of water was the lowest effective strength of solution. *Viscera* soaked in this have kept sweet for over six weeks at the cold weather temperature of Madras. Possibly a stronger solution would be required during the hot weather season. Formaline is merely a commercial name for a 40 per cent. solution of formaldehyde in water; but the commercial article is liable to vary very much in strength, and hence discrepancies are liable to occur between the results obtained by operating with different samples of the article. This is a point to be borne in mind in prescribing the strength of the

preservative solution, and if formaline is accepted as a suitable preservative, I should at first fix 20 minims to the ounce as the least strength of preservative for all seasons of the year.

4. With reference to the question as to whether the employment of formaline may be objectionable on chemical ground, I regret that my experiments do not warrant my stating anything further than this: it has not prevented the detection and the quantitative examination of some of the common metallic poisons. The Chemical Examiner, North-Western Provinces, certifies that no destructive action was apparently exercised on five vegetable poisons which he investigated. I think it would be premature to extend the application of these results without a quantitative investigation of the question extended over a very much wider field. It is true, as he states, that formaldehyde has what is known in chemistry a "reducing action"; but he does not mention the fact that one of the essential characters of all aldehydes is their tendency to form "addition compounds" with many bodies including ammonia, that alkaloids are regarded in their constitution as bodies allied to ammonia, and that while no reducing action is exercised by formaldehyde on these bodies, it is possible that addition compounds may be formed. The suggestion is thrown out merely to show that the matter has not been thrashed out, and that an old and well tried preservative should not be lightly exchanged for a new one.

5. As regards the question of comparative cost, the price of formaline is quoted in the papers under reference at Re. 1 per ounce; but it is at present about As. 4 per ounce, I believe, while the price of rectified spirit (as supplied by the Medical Stores and free from duty) is Rs. 3 per gallon or about  $3\frac{1}{2}$  pies per ounce. For each ounce of rectified spirit that is added to *viscera* for their preservation, only 20 minims of formaline will be required, hence the ratio of the cost of formaline to spirit will be roughly as 1 : 1.5. But the question does not rest here. In the case of *viscera* which necessitate examination for vegetable poisons, the *viscera* have to be extracted by the Chemical Examiner with rectified alcohol. If the packing officer has added sufficient alcohol in the first instance as a preservative, the Chemical Examiner has only to expend a relatively small additional amount for his purpose; should the packing officer, on the other hand, use formaline instead of alcohol, the Chemical Examiner has first to separate the formaline solution from the solid visceral matters and to obtain the matters held by it in suspension and in solution, he has then to extract these solid visceral matters, as well as the matters separated from the formaline solution, with rectified alcohol; and for this purpose his expenditure of alcohol will in the end be quite equal to the amount which would otherwise have been divided between the Chemical Examiner and the packing officer, while the latter has in addition been paying for formaline. It is true that cases of vegetable poisoning are relatively fewer than those of metallic poisoning, but the forwarding officer cannot with certainty distinguish between them; and I believe that in the end the financial saving, if any, will be quite trifling.

6. I must confess that I do not in the least appreciate the necessity which has prompted the proposal to substitute first salt solution, and next formaline, for alcohol. In this Presidency there has been in recent years an almost entire absence of complaints as regards packing *viscera*; the few complaints that have occurred have been quite trivial. I think that if greater attention is enforced to the rules relating to packing as has been done in this Presidency for some years past, complaints as to defective preservation and packing will disappear in other places as they have done here. In this Presidency it is the duty of medical officers and subordinates to maintain a supply of jars, of bottles and of rectified spirit, obtained from the Medical Stores, for medico-legal purposes; and from my experience I should say that the rule is very widely obeyed. It is only when the packing officer has to buy bazaar spirit and then adds an insufficient quantity of it to the *viscera* that imperfect preservation is the result. Such cases are rare in this Presidency.

7. In England, it is considered advisable not to add any preservative to *viscera*, &c., submitted to the Home Office authorities. In this country such an instruction would be impracticable, and a preservative is a necessity. Alcohol has had a long trial and has been found to serve the purpose very satisfactorily, while formaline has not been shown to have any advantages whatever over alcohol. The only advantage

apparently claimed for it is the cheapness of formaline as compared with alcohol; but this advantage is a doubtful one as already explained in paragraph 5 *supra*, while the substitution of formaline for alcohol introduces an untried agent which delays the analysis in certain cases. Viewing the question as a whole, I do not consider that any appreciable advantages are to be gained, so far as this Presidency is concerned, by the proposed change.

ORDER—No. 369, Public, dated 5th March 1898.

The foregoing letter from the Chemical Examiner will be forwarded to the Government of India.

[Here enter letter, No. 370, Public, dated 5th March 1898.]

(True Extract.)

A. T. ARUNDEL,  
*Chief Secretary.*

To the Surgeon-General.  
„ Chemical Examiner.

PUBLIC DEPARTMENT.

LETTER—from

THE CHIEF SECRETARY TO THE GOVERNMENT OF  
FORT ST. GEORGE,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,  
HOME DEPARTMENT (MEDICAL).

SIR,

With reference to your letter, No. 1346, dated 30th October 1897, I am directed to forward a copy of Proceedings, No. 369 of this date, containing a report from the Chemical Examiner, Madras, on the proposal to substitute formaline for salt as a preservative of *viscera*, intended for transmission by post to the Chemical Examiner. A copy of G.O., No. 1474, Public, dated 11th November 1897, which contains a further opinion of the Chemical Examiner on the subject of the preservation of *viscera*, is also enclosed.

I have the honour to be,

Sir,

Your most obedient servant,

FORT ST. GEORGE,  
5th March 1898.

A. T. ARUNDEL,  
*Chief Secretary.*

Government {1898} of Madras.  
**PUBLIC.**

[ Pub. ]  
29.  
2,000-5-3-97.

Public (1897) Department.

CURRENT No. 4238.

Recd. } 1898. Enclosures  
Regd. } Spare copies

Letter, No. 370, 5th March 1898.

**MARCH.**

**Chemico-legal Examinations.**

Forwarding copy of a report from the Chemical Examiner, Madras, on the proposal to substitute formaline for salt as a preservative of viscera, intended for transmission by post to the Chemical Examiner.

Order Eudl. No. 2460720-11-97  
From G. of J. Home Dept

Referred  
Forwarded to the  
Chemical Examiner  
for early report.

No. 1346

Dated 30-10-97

Received

Registered 10-11-97

Enclosures 1.

Spare copies

Mr. Col. Mun.  
Ag. Asst Secy

**SUBJECT.**

Forwarding letter from the  
Govt of North West Provinces  
& Oudh recommending  
the substitution of formaline  
for salt as a preservative  
of viscera & requesting to  
obtain a report on the  
same from the chemical  
Examiner.

# BACK PAPERS.

| G.O. | No. | Department. | Date. |
|------|-----|-------------|-------|
|      |     |             |       |

# FURTHER PAPERS.

| G.O. | No. | Department. | Date. |
|------|-----|-------------|-------|
|      |     |             |       |

[ Pub. ]  
29  
1,000-28-10-10.

Public (189 8 ) Department.

CURRENT No.

From The Chemical Examiner  
Madras

Order

No. 187

Dated 11

Received 12

Registered 14

Enclosures (2) encl. 4238 with encl. 11

Spare copies

SUBJECT.

Reporting on the proposal  
to use formalin as a  
preservative of viscera.

The following is a list of the  
viscera preserved in formalin  
and the date of preservation.

# BACK PAPERS.

| G.O. | No. | Department. | Date. |
|------|-----|-------------|-------|
|      |     |             |       |
|      |     |             |       |
|      |     |             |       |

# FURTHER PAPERS.

| G.O. | No. | Department. | Date. |
|------|-----|-------------|-------|
|      |     |             |       |
|      |     |             |       |
|      |     |             |       |

Public DEPARTMENT.

Papers to be read in Proceedings:—

Again G.O., dated 11 Nov : 1898, No. 1474 (V)

Again G.O., dated 189 , No

Current No. of 189 , dated , from

" " 4238 , 1897, " , " from the 4/1 of - 2. (a) with enc. in full.

" " 620 , 1898, " , , Chemical Exam<sup>r</sup> (u)

ORDER No 369 of 5. 3. 98  
P.S.

The foregoing letter from the  
Chemical Examiner will be  
forwarded to the Govt. of India.

This is an excellent  
convincing letter

of Dr. Van L's. This is an  
excellent man for  
the post W.S.

To  
The Surgeon-Genl.  
" Chemical Exam<sup>r</sup>.

19/12/98  
11/12/98  
Letter No 370.

To the Sec<sup>y</sup> to the Govt of India,  
Home Dept. (Medical)

Sir,

With reference to your letter No. 1346  
dated 30<sup>th</sup> Oct 1897, I am directed to  
forward a copy of Pro<sup>l</sup> No ...  
of this date containing a report  
from the Chemical Examiner, Madras,  
on the proposal regarding the substi-  
tution of formaline for salt as a

22/11/98

preservative of viscera, intended for  
transmission by post to the Chemical  
Examiner under the orders contained  
in Home Dept Resolution No. 472-481

~~Letter No. 11, May 1897. A copy of~~  
Go. No 1474 Pub. d/11 Nov. 97 ~~also accompanied~~

~~enclosed~~

182.98

19/2/98

which contains a further  
opinion of the Chem. Examr  
on the subject of the preservative  
process is also enclosed  
C. S.

MA 212.98

First copy sent to Press.

Returned for signature.

Despatched in print.

READ AGAIN G.O., No. 1474 Pub. d/11 Nov. 97

CURRENT No. 4238 with enc, of Credit No. 2460.  
of 20/11/97 and C.No. 620 — } A.

ENCLOSURE TO C. No.

ORDER OF GOVERNMENT .. .. A

LETTER OF GOVERNMENT .. .. A.

STATEMENT WITH DITTO.

PAPERS NOT FILED UP, BEING MEANT FOR REFERENCE  
IN ORIGINAL.

2  
Send copies of the current  
press and also a copy of  
y.o. 1474 to y.o. of 9.  
11/11/97

N.B. —

A = Print in full.  
B = Not to be printed.  
P = Print abstract only.  
Q = Print heading only.

NUMBER OF COPIES  
REQUIRED. { Order complete.  
Letter only.  
Order complete with letter.

For the Press  
Please send first two copies  
of the Order and of letter  
for signature and date.  
19/2/98