

A PRELIMINARY REPORT ON THE MEDICO-LEGAL VALUE OF THE FINDING OF BLOOD ON NAIL PARINGS

By D. P. LAMBERT, M.D., D.T.M. & H. (Univ. Edin.)
MAJOR, I.M.S.

Civil Surgeon, Meerut

GIVING evidence recently before the Lahore High Court, the chemical examiner for the Punjab stated that in his opinion the finding of human blood on the nail parings of an accused person had 'Absolutely no medico-legal value whatsoever'. In support of this opinion he gave a short list of some possible sources of

(Continued from previous page)

The results (table III) show that there is an increase in the albuminoid nitrogen content of the water when the sample of water is autoclaved. It is suggested that this increase of nitrogen is due to the hydrolysis of the finely suspended organic matter in the water. There is an increase in autoclaved water in the food material available for the growth of vibrios.

It will be seen that *Vibrio cholerae* does not survive long in natural waters. In spring water it dies out in less than two hours and its longest duration in untreated natural waters is 72 hours. In autoclaved samples the viability is considerably increased.

In natural waters that have been rendered bacteria free by filtration through a Pasteur-Chamberland candle, the viability is increased and when such a sample is autoclaved the vibrio is capable of surviving for a longer period.

Conclusions and Summary

(1) The viability of a freshly isolated strain of *V. cholerae* in natural waters has been examined.

(2) The viability of *V. cholerae* in samples of waters that had not been treated in any way was found to vary from one hour in samples of hill water to 72 hours in water collected from certain tanks. These tank waters were found to contain a considerable amount of organic matter and to have a high salt content.

(3) The viability of *V. cholerae* is considerably increased in autoclaved samples. It is suggested that the increase in viability is due partly to the increase in the available food supply in the autoclaved water which results from the break-down of the suspended organic matter.

(4) Choleraphage was not found in any of the samples of water tested.

REFERENCES

- d'Herelle, F. (1926). *The Bacteriophage and Its Behaviour*. Baillière, Tindall and Cox, London.
d'Herelle, F., Malone, R. H., and Lahiri, M. N. (1930). *Indian Med. Res. Mem.*, No. 14. Thacker, Spink and Co., Calcutta.
Hankin, M. E. (1896). *Ann. Inst. Pasteur*, Vol. X, pp. 175 and 511.

innocent contamination, and implied that such contamination was so usual as to be almost a normal finding. He also stated that it was 'most unlikely' that blood could be detected on the nail parings of a man accustomed to wash regularly, twenty-seven days after his hands had been stained by blood [The *Statesman* (Northern India Edition), 28th November, 1938, p. 14]. After hearing this evidence the High Court ruled that 'An end will now be put to nail paring evidence in this Province'.

In view of this ruling it seemed important to verify these statements by experiment. After testing the sensitivity of the reagents, I examined the nail parings of forty under-trial prisoners and of twenty convicted prisoners from Meerut District Jail. The parings were taken by the jail barber using his ordinary instruments and without any special precautions against contamination. Of the 600 separate nail parings so obtained three gave a positive reaction, and six gave a positive trace with the benzidine test. The remaining 591 were all negative. These specimens were received in bulk, so it is impossible to say whether the positively reacting nails all came from one person or from nine separate persons.

The benzidine test which was used throughout these experiments is very sensitive, but it is not a specific test for blood. If blood is present the test will detect it, even in extreme dilution, but a positive reaction is not a certain proof of the presence of blood, still less of human blood. These limitations of the test should be constantly borne in mind in interpreting the results.

The nails of ten hospital patients who had either open wounds or a free discharge of blood from some part of the body were next examined. It was impossible to be certain that these men had had their nails contaminated with blood, but it seemed very likely. The parings were made with ordinary hospital scissors, clean but not specially cleaned, and no unusual precautions were taken in cutting. The results of examining these nails are shown in the table below.

Compared with the results of the jail series the difference is striking. Some light is also thrown on the period up to which blood may persist beneath the nails. Assuming that no gross contamination took place after admission to hospital, blood persisted under the nails of these persons for an average period of 24 days, with a maximum period, disregarding traces, of 35 days. All these patients washed regularly, but none used soap, nail-brush, or any refinement of manicure.

As a control series I examined the nails of the remaining 24 hospital patients. Twelve sets of nail parings were completely negative. Eight sets showed a positive trace on one nail only. One set showed two positive traces. Of the remaining three patients one gave one positive reaction and one a trace. This man had

persistently tampered with his dressings after operation. The second gave two entirely unexplained positive reactions; and the third, who had had one nail cut to the quick on paring, gave a strongly positive reaction on that nail and a positive trace on the next. These results too contrast with those of the first group,

that a person may contaminate his nails with his own blood in many ways; but contamination with blood of a group other than his own would require a great deal more explanation. In this type of investigation blood grouping should never be omitted; otherwise valuable evidence may be lost.

TABLE

Case number	Source of bleeding	Days since admission to hospital	RESULTS OF THE BENZIDINE TEST		
			Strongly positive	Positive	Trace
1	Open wound	14	..	3	4
2	Bleeding ulcer	22	..	2	..
3	Bleeding dysentery	1	..	6	..
4	Open wound	1	1	5	..
5	Bleeding ulcer	39	2
6	Open wound	91	1
7	Open wound	9	..	2	5
8	Open wound	7	1	2	7
9	Open wound	35	..	3	2
10	Hæmoptysis	24	..	4	2

particularly if traces are disregarded. If contamination with blood is likely to occur anywhere it is likely to occur in an Indian District Hospital, and the results suggest that accidental contamination is not likely to amount to more than a trace, and that only on one or two nails.

Another experiment was made to find out the extent to which blood-stained scissors were likely to contaminate the nails they pared. Hospital scissors were smeared with blood and the blood was allowed to dry on. The scissors were then roughly washed and mopped dry. They were not polished or specially cleaned. After this treatment the scissors themselves gave a positive trace reaction, but nails cut with these scissors remained negative. This experiment was repeated several times with consistent results. If ordinarily clean scissors are used, and reasonable care taken in paring, it seems unlikely that serious contamination can arise from this source.

In his statement before the High Court, the chemical examiner made no reference to the subject of blood grouping. It is conceivable

I would re-emphasize the preliminary nature of these experiments, and again draw attention to the limitations of the benzidine test; but they strongly suggest that contamination of the nails with blood is neither a common nor a usual finding, and that every contamination of many nails is only likely to occur by contact with shed blood. The finding of blood on an accused's nail parings is certainly not conclusive evidence of guilt; but it is equally unscientific to say that such evidence is of no value whatsoever. The court will decide in each case what weight the scientific evidence will have.

It is very desirable that this subject should be re-investigated on a larger scale, using spectroscopic and precipitin methods. The ideal place for such a research would be a well-equipped medico-legal institute, the want of which provision greatly handicaps the administration of justice in India.

I have pleasure in acknowledging the courtesy of the Inspector-General of Civil Hospitals, U. P., and the Chief Justice of the High Court, Lahore, in permitting me to publish this paper.

A Mirror of Hospital Practice

ACUTE MEDIASTINAL EMPHYSEMA WITH GENERALIZED EMPHYSEMA

By F. A. B. SHEPPARD, F.R.C.S. (Edin.)

CAPTAIN, I.M.S.

District Medical Officer, Madura

ACUTE mediastinal emphysema is probably a common sequel to severe crushing injuries of the chest, but as it is frequently complicated by

other intra-thoracic damage it is not often that such cases are presented for treatment. In itself the condition calls for urgent surgical intervention as with each breath taken more air is forced into the relatively closed and restricted space of the mediastinum. As the blood returns to the heart from the lungs and the systemic circulation bears the brunt of the compression it is not surprising that signs of cardiac failure