THE IDENTIFICATION OF SEMINAL STAINS.¹

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At the last meeting of the Society a paper was presented by Dr. Wyatt Johnston describing a micro-chemical test for seminal stains proposed by Florence, of Lyons. It is briefly as follows: A suspected spot is soaked in distilled water for a few minutes, and to the fluid obtained is added a drop of a saturated solution of iodine in iodide of potash (iodine, 1.65; iodide of potash, 2.54; water, 30). An immediate precipitation of dark-brown rhombic crystals of iodine takes place. Their general shape and appearance very closely resemble those of the so-called hemin crystals, which are obtained from blood stains by Teichman's test. (Fig. 1.)

FIG. 1.

Crystals obtained by Florence's reagent, from a spot on cloth eight months old.

The reagent and material were placed in my hands for confirmation of the statements made in regard to them. I have gone carefully over the ground, and find the facts to be, in every particular, as stated.

The reaction took place readily both with the material furnished by Dr. Johnston, and that which was prepared under my own direction. The only difficulty encountered was that it was found impossible to dissolve all of the iodine according to the given formula. But after taking up as much as possible the filtrate was found to act perfectly.

Crystals were readily obtained from stains, which had been dried for a few days, several months, and two and a half years.

Stains from any other of the ordinary fluids, etc., of the body (urine, saliva, milk, fecal material), failed to give the reaction, as well as from leucorrheal and gonorrheal discharges.

Trials were also made from the contents of human testicles, epididymis, and seminal vesicles without any result; except in one recently excised testicle a few small crystals were thrown down by the fluid squeezed from the epididymis. The fluid from a spermatocele containing large numbers of spermatozoa was also negative. The fluid expressed from the prostate was without action, both when used alone or mixed with

the secretion from the seminal vesicles. Of course, with the exception of the testicles, the material came from the autopsy table, and post-mortem changes cannot be ruled out. But the evidence from all of the available material shows that as far as man is concerned the peculiar substance which gives the reaction is formed in the mixed seminal secretion during life.

From the epididymis of a rabbit, however, an abundant precipitation of small crystals was obtained; while from that of a dog there was no result.

A preparation was made from a spleen from a case of leucemia, in which were numerous Charcot-Leyden crystals, which are regarded as identical in composition with those formed in slowly evaporated semen. The result of the test was negative.

I can throw but little additional light upon the nature of this peculiar substance; and its isolation must be left to the chemists.

But it is certain that the test will be of great value in preliminary examinations for medico-legal purposes, and one that should never be omitted in the examination of suspected spots.

As the reagent gives a precipitate with many of the alkaloids (morphine, strychnia, etc.) and their salts, its chief value is a negative one, just as is the guaiacum test for blood stains. So that if a positive result is obtained the further step of demonstrating the presence of spermatozoa must be taken before it can be submitted as evidence in court. For this end, I have made a series of studies to improve the technique and so facilitate such examinations. And the following is the best method which I have found, thus far:

A small bit is cut from the cloth on which is the suspected spot, or if it is on a hard surface a little is scraped from it. This is placed on a cover-glass, wet with a drop of distilled water, in which it is carefully teased apart with fine needles and the larger fibres removed. The drop of fluid is carefully evaporated over a flame and fixed to the surface by rapidly passing it through it three times. Upon the film thus formed, are poured a few drops of an aqueous solution of eosine, which is allowed to act for a few seconds and then washed off with distilled water. An equal amount of a strong aqueous solution of methyl green is then poured on and gently heated over the flame until it steams. It is again washed, dried and mounted on a drop of Canada balsam dissolved in xylol. The preparation thus obtained is permanent, can be examined with the highest powers of the microscope, and exhibited in court, if necessary.

When entire, well-preserved spermatozoa are found there is no difficulty in their identification. But when the stains have been dried for some time, it is usually difficult to obtain such ones, for the heads are then very easily broken off from the tails. And in an unstained preparation, the former can easily be mistaken for spores, or *vice versa*, and the tails are almost invisible from their smallness and transparency. With the method above given, certain differential characters of the head can be made out which leaves no doubt as to their identity. Its composition is stated in the books to be of the same character as the nucleus of a cell (chromatin) and stains with the same reagents. But an examination of Fig. 2, will show that the whole head does not stain alike. At the base is a hemispherical portion which stains of deep green, while the anterior part and the tail takes the red color of the eosine. This serves at once to identify it, as

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there is no other oval spore or cell which has an eccentric hemispherical nucleus.

And, furthermore, this not only shows that they are spermatozoa, but also that they are from man. For in no other animal is there a deep staining. For in all the others, the head stains of a very diffuse light green, with only a very narrow zone of a pale red color about it. Then, too, the shape of the head is different, being more pointed in man (wedge- or lance-shaped), while it is rounder (shovel-shaped) in the lower animals. Those of the dog are most like the human, both in shape and details of staining; but a little experience will show differences quite plainly.

With this method, stains varying from a few days to two and a half years old were examined, and in all the differentiation of staining was preserved, and the identification could be easily made.

From the above it is evident that with Florence's test and the double staining of the spermatozoa, there should be no doubt in the mind of the medical examiner of the presence or absence of semen in a suspected spot.

ON THE DUTIES OF A MEDICAL EXAMINER AS A WITNESS.¹

BY SHERMAN HOAR,
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MR. PRESIDENT AND GENTLEMEN: When I was at Cambridge, an instructor once gave out to six members of my class the same subject upon which to write a theme, giving us opportunity to read over each other's compositions, and telling us to then make our own compositions original, if possible. Then the Instructor took our papers, and read them out aloud to the class; mine happened to be the last one. When he came to mine, he asked me to read it, and I began. As I read he said, "That is true; but Smith has already said that." And then he took up the next proposition, and said, "That is true, but Sewall has said that." And so on, one page after another, with all my propositions, until he came to my name; then he said that was the original thing in my composition. I think when I get through, the name will be the only original part of my propositions. For, like the Attorney-General, I have not been able to prepare myself for such an occasion as this.

I entirely agree with the Attorney-General that the first duty of anybody connected with the prosecution of crime is judicial; that no person can properly, either as prosecuting officer or medical examiner, or as a witness, serve on a case except as a judicial officer in the first instance; and I think that is too often lost sight of both by prosecuting attorneys and by medical examiners. I think it is very essential for everybody first to ascertain the facts and to find out exactly what is true, and then to be able to express that truth in such a way as to convince twelve men of at least ordinary intelligence.

I have had little experience with medical examiners. I have tried but one murder case in all my life, and that is all I want to. In that murder case I had a medical examiner from this district who gave evidence, and a medical examiner from Halifax who gave evidence, and the difference between the two men illustrates exactly what I want to say. One of them had

made his investigation as a judicial officer; the other had made his seemingly for his own aggrandizement. He had his own dignity to maintain; he had his own opinion to maintain. He had an absolute inability to make himself understood by any human being who listened to him.

Now you have not only to ascertain your facts judicially, to keep your mind open, to do what the Attorney-General said so well, "ascertain all the facts"; but I would like to add that not only should the medical examiner ascertain all the facts which the autopsy shows, but should be able to make twelve men selected almost at random understand what he means when he states those facts. I have heard medical experts give testimony a great many times; sometimes I have understood them, and sometimes I have not. I have heard two medical experts give testimony in the same case, one of whom I understood and the other I did not understand. And I say that a knowledge of the English language is essential, as essential as a knowledge of medical terms. You must remember that Dr. Holmes once said of a lawyer that he had to half-know more things quicker than anybody else in the community; and you have got to get your lawyer, your prosecuting attorney, to half-know what you know, and be able to draw it out of you on the instant on the witness-stand; and you have got to get him into a condition of mind, by the use of ordinary, plain, Anglo-Saxon words, to understand your exact view of the case. You have got to get him into a condition where he can draw out from you what you want to present to the jury, to the twelve men, often of very limited understanding. And if I could add anything to what the Attorney-General has said, it would be to urge the right and simple use of the English language in putting in your evidence.

When you come to testify, you are so apt to qualify your judgment that you don't give your opinion, but your qualifications first. And if I should make a suggestion to you, it would be to give your judgment first, your reasons for it next, and any limitations upon your judgment last. I think the jury would understand you better if you did that.

I should like to have medical examiners remember that they are judicial officers; that they are part of the machinery of the Commonwealth to detect crime. I don't believe that, as such judicial officers, they have a right to take sides in any case whatsoever; neither do I believe that, as such judicial officers, they have any right to take the side against the Commonwealth in any case which may be presented in the Commonwealth. I believe that they ought to always keep their minds open; to learn all the facts accurately—medical and otherwise; that they ought to keep themselves in a judicial condition of mind until the case is through; that they ought to give their opinion first, their reasons next, and qualifications of that opinion last; that they ought to try to reduce everything they say to the ordinary language of human beings who are on the jury before them.

LEAD-POISONING FROM SNUFF.—A case of poisoning from snuff adulterated with lead has been discovered in New York, and the tobacconist who sold it has been arrested for obtaining the price of the snuff upon false pretences. As snuff was not a food, he could not be held for selling adulterated food.

¹ An Address before the Massachusetts Medico-Legal Society, February 3, 1897.