Thorax.—Tubercle in all stages in both lungs, which were generally adherent; small tubercular cavity in lower and posterior part of middle lobe of right lung; bronchial glands much enlarged.

CASE 46.—*Acute Deposition of Tubercle in Lungs, Pericardium, Pleuræ, Peritoneum, etc., simulating Fever; Death by Asthenia with Typhoid Oppression.*—[Reported by Dr Andrew, Dr Gairdner, and Dr W. Clarke.]

Patient, a female, æt. 34; for about a year intellect had given way, and for same period had had indifferent health, with diminished strength, and tendency to reject food. For some weeks febrile symptoms, with gastric irritation and tenderness on pressure over abdomen, much vomiting, occasional diarrhœa, great prostration; skin usually dry; pulse at first hard, afterwards quick, weak, and irregular; slight cough with purulent expectoration (in no great quantity); no marked dyspnœa. Two days before death some ounces of blood passed from bowels. Died exhausted, after typhomania, not very apparent, had continued for some days.

Dissection—by Dr Gairdner.—Tubercle mostly yellow miliary, very extensively deposited in lungs; tubercular adhesions of pericardium, pleuræ, and of the peritoneum, between diaphragm and spleen; incipient tubercle of liver, spleen, and kidneys; tubercle in mesenteric glands; three small tubercular deposits in brain, two in white matter of hemispheres, one in left crus cerebri.

Part Fourth.

PERISCOPE.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

INFANTICIDE—PLEA OF PUERPERAL INSANITY.

NORTHERN CIRCUIT.—*Newcastle, Feb. 27.—Crown Court; before Mr Justice Cresswell.*—Hannah Ridley, aged 28, was indicted for having, at Allendale, on the 10th of December last, wilfully murdered her new-born female child.

Henry Philipson stated, that he engaged the prisoner as his servant, in May 1851, for half a year. She remained with him till the 10th of December. About the end of October witness told her he had heard she was pregnant, and she said it was not the case. On Monday, the 8th of December, witness left home, and remained away till six o'clock on Tuesday morning, when he returned. On reaching the house he met Margaret Davison, his present housekeeper, and from something she said he went away again to feed some cattle. He returned again at nine o'clock, and found that the prisoner had been delivered of a child. Witness knew William Pruddah, a chemist, at Hexham. He bought threepence worth of arsenic from him, in the beginning of the year 1851, for the purpose of destroying rats. The arsenic was wrapped in a paper, which had the words "Arsenic—poison" upon it. He took it home, and used more than half of it. He mixed what he used with grease. He ordered his housekeeper, Hannah Green, to destroy the rest, and did not afterwards see it, or say anything about it. Cross-examined.—Prisoner was a good, kind-hearted woman, while in his service. She was subject to great depression of spirits, and often in "deep

studies." Hannah Green is dead. The arsenic was wrapped in whitey-brown paper.—Margaret Davison said, that she was the last witness's present housekeeper. He engaged her on the 11th of November of last year, and she went on the 18th. The prisoner was then in the house, acting as housekeeper. She observed that she was in the family-way. On the morning of the 9th of December, witness was called up at five o'clock. The prisoner had been sleeping with her that night, but when Michael Stobbs called her the prisoner was not in bed. Witness went in search of her, and found her by the bedside, in her master's bedroom, and in labour. Witness asked if she was in labour, and prisoner said it was not her time. The doctor and Mary Anne Philipson came. The child was born shortly afterwards. It appeared to be a fine healthy child. On the morning of the 10th the child was sick, and Mrs Philipson gave it some milk. The child got worse, and died that evening. Mrs Philipson came before the child died. It was a girl. Mr Hewitson, surgeon, was there after the child died. He spoke to the prisoner, and gave witness a cup, in which was some milk and water and sugar, to take down stairs. The prisoner appeared distressed when the child died. Directly after the child was born, witness lifted prisoner's pocket, and two small whitey-brown paper parcels dropped out. The papers seemed much soiled by being carried in the pocket. When the surgeon came after the child was dead, he went up stairs a second time, and witness accompanied him. He asked prisoner if she had given the child anything, and she replied that she would rather beg with it. Mr Hewitson said, that if she had given it nothing she would not be against having her pocket searched; prisoner held out her pocket, and he searched and found one loose paper in it. It was the same kind of paper as that which witness had seen fall from prisoner's pocket. Mary Anne Philipson was present at the time, and shortly afterwards asked the prisoner if she had given the child anything, as the doctor was going to open the stomach, and analyse it. Prisoner seemed much distressed, and put a handkerchief over her face. After the child was born, the prisoner said it was a comely child, and said, "God bless it."—Mary Anne Philipson said, she had known the prisoner since May last. She was sent for to Mr Philipson's, on the morning of the 9th of December, and on getting there found the prisoner in labour. There were no clothes to dress the child with, and witness went to her own house to get some. She went again the next morning, and found the child vomiting. In the evening the child died, and after its death witness went up stairs with Margaret Davison, and asked the prisoner if she had given the child anything. In answer the prisoner said she had given it a little arsenic. She said she got it from a shelf. Before she said this, she put her handkerchief over her face, and appeared distressed. She had not sufficient milk for the child. Witness went to clean the house before the prisoner went to Mr Philipson's, and found a small brown parcel on a shelf in the kitchen. There was some writing on it, which Jane Stobbs read. The parcel was left upon the same shelf. There was also a plate with some grease upon it. Mr Philipson afterwards made some inquiry about this plate, and it was taken away and destroyed. Cross-examined.—The prisoner had no milk for the child. She often seemed low-spirited, and in deep study. After she was confined, she asked witness to get her some flannel, and said she wished she had got home, for she had plenty there.—Margaret Davison, being recalled, said that she heard the prisoner say she had given arsenic to the child, and that the arsenic was in her pocket, mixed with sugar. She said that she had put it into a spoon, and then given it to the child.—Jane Stobbs, a niece of Mr Philipson, said that in May last year she was helping to clean Mr Philipson's house. Mary Anne Philipson and Mary Stokoe were there. She saw the plate of grease, which was taken away by Mary Stokoe.—Mary Stokoe deposed, that when at Mr Philipson's in May last she received a plate of grease from the last witness, and threw it down the burn.—Mr Hewitson, surgeon, said, that on the 9th of December he went to Mr Philipson's, and assisted at the birth of the prisoner's child. It was a stout healthy child. In the evening of the next day he went to the house, and found that the child was dead. He examined the body,

and charged the prisoner with having given it something, but she denied it. He asked to search her pocket, and she said he was quite at liberty to do so. In the pocket he found a piece of whitey-brown paper, and in it were what appeared to him to be crystals of sugar. He asked the prisoner what the paper contained, and she said it contained sugar. He then went down stairs, and directed that the body should not be interred until the coroner had been communicated with. He went up stairs after Mary Anne Philipson came down, and asked the prisoner what caused her to do such a thing, to which she made no reply. He asked her how much arsenic she gave the child. She replied that she gave it "a pinch." He made a post-mortem examination of the body on the 12th of December, and sent the stomach and bowels and their contents to Dr Glover, in three separate jars. The prisoner always appeared perfectly rational. Cross-examined.—When women have suppressed milk it has occurred that they have had puerperal mania. Such an attack frequently causes them to have a desire to kill their own offspring. Fits of delirium sometimes come on when they are in that state, and last only a few hours. A person of low desponding habits would be more likely to have delirium than any other. If the woman was in fear after confinement when left alone, that might produce delirium. Re-examined.—The prisoner's case appeared to me one of want of fluid, rather than of suppressed milk.—Charles Christopher Hewitson, brother of the last witness, said he visited the prisoner after the birth of the child, but never saw any symptoms of puerperal mania or insanity.—Dr Glover deposed, that he had had very considerable experience in making analyses. He received from Mr Hewitson some jars containing the stomach and intestines of a child, and also a piece of paper. The intestines exhibited marks of extensive inflammation. Witness described the appearances and the process to which he subjected the stomach and intestines, the result of which was the detection of arsenic. He also subjected the piece of paper to a test, but the indications were so slight that he could not speak decidedly as to there being any arsenic upon it. The result of the analysis was, that he found a sufficient quantity of arsenic in the child to cause death.

Mr Overend, in addressing the jury for the prisoner, said that he did not pretend to disguise from himself the fact, that there were circumstances of very considerable suspicion affecting the prisoner. A great deal of evidence had been brought forward, not to show that the prisoner gave poison to the child, but to show that there was something antecedent to the act to make them believe that she designed the murder. The first thing suggested was, that she ought to have left her master's house early in November, whereas she lingered about; but he thought that was satisfactorily explained by the fact of her master asking her to stay, and the carrier being unable to take away her box. The next thing was, that she had prepared no linen for her child; but the defence was, that she was taken in labour before she anticipated it, and having had a child previously, there was linen which had been used for that, remaining with her parents, and therefore there was no occasion to provide for more. There was nothing to show that she behaved unkindly to the child; but that, on the contrary, she had manifested the greatest tenderness. That poison was found in the child he did not deny, but the question was—Who administered it? If the prisoner did administer it, under what circumstances was it done? Did she do it by mistake, by design, or under the influence of delirium common to women after confinement, when she was not accountable for her own actions? He did not think it possible that she could have made a mistake, and as she had not suggested that, he did not think he could urge it. She was a person of low desponding habits; and after witnesses had spoken to her character and manners, he thought they would see that the most reasonable mode of solving this difficulty would be to suppose, that if she administered the poison it was at a time when she was not accountable for her actions.—Witnesses were then called to speak to the prisoner's character and habits, all of whom said she was frequently in a low state of mind.—William Montgomery, surgeon, was then called, and said that he attended Hannah Ridley in August 1847, four or five days after her first confinement. She was then suf-

fering from puerperal insanity, which lasted for a fortnight. It is a disease women are sometimes subject to after confinement, caused by a suppression of milk. Having suffered from it at her first confinement, she would be more disposed to it than another at a second confinement. Being left alone, or being in a desponding state, would dispose to it. It might not last more than twelve hours, or perhaps less, though he could not speak to it from experience. Persons thus suffering have been known to have a tendency to destroy their offspring.—Dr Dawson, of Newcastle, said there was such a disease as puerperal mania, which developed itself in various ways. It was met with in women of low melancholy temperament, and was preceded by lowness of spirits. In some cases it manifested itself in expressing dislike to friends, and very often in a tendency to destroy their offspring. It might pass off in a very short time, perhaps in one or two hours. Insanity to the extent of taking away life might exist for that time, and then pass away. If poison was in the house, and a person was in that state of mind, and she knew it was in the house, she might be as likely to make use of that as anything else.—His Lordship, in summing up, told the jury that they must first be satisfied whether the prisoner administered the poison to her child wilfully, and if they were, then unquestionably she was guilty of murder, unless it was made out to their satisfaction that she was not at the time what is called a responsible agent. Every person who wilfully causes the death of another without some excuse was guilty of murder, and in this case, if the prisoner was guilty, he could not point out any circumstances making it less than murder, unless they were of opinion that she was not a responsible agent. He would read the opinion of Lord Chief Justice Tindal:—"A jury ought to be told in all cases that every man must be presumed to be sane, and to possess a sufficient degree of reason to be responsible for his crimes, till the contrary be proved to their satisfaction; and to establish a defence on the ground of insanity, it must be clearly proved that at the time of committing the offence the party was labouring under such defect of reason, from disease of the mind, as not to know the nature and guilt of the act he was doing, or not to know that he was doing what was wrong." Therefore, if they were satisfied that the prisoner wilfully destroyed the child, they must presume that she was competent to know what she was doing, and a responsible agent, until the contrary was proved on her behalf. If it was made out on her behalf to their satisfaction, that she was in such a state as to be incapable of understanding the nature of the act, she would be entitled to an acquittal. His Lordship then read the whole of the evidence, and at the close, remarked that he was bound to tell them that there was undoubtedly no direct proof that the prisoner was otherwise than in her perfect senses, as no person saw her labouring under delusion or insanity.—The jury retired for some time, and then returned a verdict of *Not Guilty*. His Lordship.—Do you find her insane? The Foreman.—We do, my Lord. His Lordship then ordered the prisoner to be detained during her Majesty's pleasure.—*Legal Examiner and Journal of Medical Jurisprudence*, March 6th, 1852.

MURDER BY STRANGULATION—LONGITUDINAL RUPTURE OF TRACHEA.

MIDLAND CIRCUIT.—*Northampton, Feb. 27.—Crown Court; before Jervis, L.C.J.*—Elizabeth Pinckard, aged 51, was indicted for the wilful murder of Elizabeth Pinckard, her mother-in-law. The prisoner is the wife of a farmer residing at Thrupp, near Daventry, in this county, and the deceased was the second wife of the prisoner's father-in-law. The deceased and her husband lived in a cottage on the Daventry road, about three-quarters of a mile from the house in which the prisoner and her husband lived; and it appeared that early in the morning of the 3d October last, the two Pinckards, father and son, went together to Daventry fair, leaving their wives at home. About half-past five o'clock in the afternoon of the same day, a man of the name of Bird was passing the cottage of the deceased, and observing the door open, went in. His evidence was extremely important in the case, because he was the first person who examined carefully the position in which the body of the deceased was found after death. When

he went in, he found the body of the deceased stiff and cold. It was sitting on the floor (in a corner), with the back against the front wall of the cottage, the left side against a corner cupboard, and tape round the neck. The other end of the tape was fastened to a hook in the cupboard, and the head was inclined away from the cupboard, so that the tape was on the stretch; but the loop round the neck of the deceased was so loose, that Bird could easily insert his fingers between it and the neck. Her legs were stretched out on the floor perfectly straight; her hands were lying in front of her, also perfectly straight; and her clothes were down over her legs, not at all disordered. Bird easily broke the tape with his hand, but when he had done so, the body remained still in the same position. It was, however, removed before the post-mortem examination took place; and upon that examination a contused wound was discovered upon the right eyebrow; and under the skin on the upper part of the head, on the right side, there were a few spots of extravasated blood, which might have been occasioned by slight blows. A spot of blood was found on the wall above the head of the deceased, and one or two on the floor. The face was swollen and discoloured. There was a mark round the neck as if produced by the tape; but the remarkable feature of the case was, that the trachea or windpipe was ruptured longitudinally on the right side,—that is, the rupture extending up and down the trachea. This being the condition in which the deceased was found, the impression at first was, that she had committed suicide; and upon the part of the prisoner, the same suggestion was still made.

Dr Alfred Taylor, the lecturer on medical jurisprudence at Guy's Hospital, was examined upon this subject, and stated that, in his opinion, the facts proved were inconsistent with the supposition that the deceased committed suicide. The rupture of the trachea longitudinally was a most extraordinary circumstance. He had never known an instance of it. It was impossible that the tape round the neck of the deceased could have done it. He had examined the tracheas of five persons who had died under the hands of the public executioner, and in no instance was the trachea ruptured longitudinally. He could only conceive such a rupture being produced by the application of lateral force compressing the whole tube. If a ligature was drawn tightly round the neck, and a stick introduced to act as a lever, the trachea might probably in that way be lacerated longitudinally. Dr Taylor also stated that the effect of strangulation was a spasmodic contraction of the hands and limbs, which might, however, be restored to their natural position by another person, if it was done immediately after death. Upon cross-examination, Dr Taylor said that there existed considerable differences of opinion in the medical world upon suicidal or homicidal cases. In the case of the Duke de Bourbon, there was a difference of opinion, but the majority believed that he destroyed himself. There were on record instances of suicide by strangulation effected in almost every possible attitude, and after the person had inflicted upon himself other acts of violence. If the rupture of the trachea had been produced by lateral pressure on the throat, he should have expected to find some external marks of that violence.—Two other medical gentlemen were examined—Mr Sharman, of Daventry, and Mr Nash, of Northampton. They made the post-mortem examination, and the former, although he was not aware that the longitudinal rupture of the trachea was at all remarkable, was of opinion that, taking all the circumstances into consideration, the deceased could not have committed suicide. The latter appeared inclined to think it possible that she might; but expressed himself with great hesitation and uncertainty. The chief proofs against the prisoner were, that she had been seen about the house of the deceased, near the time of the supposed murder; and one man swore that at about a quarter past eleven he heard groans and a scuffling, as of several persons in the house; and three women, who, just about the same time, were standing at a distance of 200 yards, heard cries of "Murder" proceeding from the cottage. At a quarter to twelve the prisoner was seen to enter her own house. She had then no shawl or apron on, her gown was torn in the gathers, and in the afternoon she changed her dress, and put the one which she had taken off into the wash-tub. Small spots of blood were afterwards found on her apron and shawl, and some tape

was found in a drawer in the prisoner's house. A mallet was also produced, with regard to which the prisoner herself had said that that was such a thing as was likely to have given the blows to the deceased. In order to show a motive for the commission of the crime, it was proved that, upon the death of the deceased, the prisoner and her husband would become entitled to a sum of L.900 odd; and that shortly before the 3d of October they had been pressed by their landlord for payment of arrears of rent.

The Lord Chief-Justice summed up the evidence, and the jury, after remaining in deliberation about a quarter of an hour, returned a verdict of *Guilty*. His Lordship then sentenced the prisoner in the usual terms.—*Legal Examiner.*

ON TATTOOING: A NEW MEDICO-LEGAL QUESTION. THE TRIAL OF SCHALL: A CAUSE CELEBRE. BY CASPER OF BERLIN.

(*Translated from the Vierteljahrsschrift für gerichtliche und öffentliche Medicin.* 1 *band*, *s.* 274.)

The legal investigation of the charge of robbery and murder preferred against Schall (formerly a postilion), which occupied the district jury court which sits in Berlin, for the first eight days in March, naturally caused great excitement in the capital, and for a week was almost the sole subject of conversation. And even now, when judgment has been pronounced, competent judges and the general public still talk with interest of the trial, reconsidering and weighing the many doubtful points with which it was complicated. Seldom, however, has a great crime been so shrouded in mystery as in the present instance,—and certain it is, that since the procedure in such cases by jury-trial was first introduced here, no case of such consequence has been the subject of public investigation. It involved, besides, in a scientific and medico-legal point of view, a number of important and partially decisive questions, for the solution of which I was summoned by the counsel for the Crown. Among these questions there was one, entirely new, and of which I did not hesitate in open court to affirm, that it had never been scientifically examined, and hence that, in general, "medical men did not know much more about it than others." I mean the question: Can tattooing-marks become effaced during life?

All these grounds will justify me in undertaking here to give a short account of this true *cause celèbre*, as I have become acquainted with it from the study of the legal documents and public proceedings connected with it; and in doing so I shall regard the case specially in a scientific and medico-legal point of view, and accurately communicate what I have myself on this occasion observed and learned regarding tattooing.

On the 10th September 1849, not far from Berlin, and in the immediate vicinity of a game preserve and a branch of the Spree, there was found among the reeds the body of a man, from which the head had been removed by a clean incision, passing, as the medical witnesses afterwards affirmed, in a straight line between the first and second cervical vertebræ. The head was found at a distance of fifteen paces, and displayed a double shot-wound below the right ear, directed from below upwards, many apparent wounds caused by cutting the face, and complete comminution of all the bones of the head causing it to fall into a flattened shape when lifted and again laid down. It was obvious that the murderer or murderers had thus disfigured and mutilated the head, to conceal the deed, and prevent the identification of the murdered man—an object which was indeed perfectly effected. The attempt had, besides, been obviously made, for the same reason, to throw or drag the head into the river; this had not been accomplished, probably in consequence of the extremely swampy nature of the ground about the banks. Near the body a little crooked stick was found sticking in the earth; near it a gray cap, and an open match-box, in which some sulphur matches still remained.

The body was clothed with a shirt (marked G. E. 4), two chemisettes, drawers, and summer trousers, worsted stockings, boots, a satin vest, and leather

embroidered braces, which were found unbuttoned. As was acutely remarked by the Crown counsel, they had probably been loosened when the good cloth upper trousers, which, together with money, a watch, and signet-ring, had been stolen from the murdered man, were removed. On the ring-finger of the right hand there was a golden marriage-ring, marked H. H., 1843; and in the course of the oral evidence the important fact was elicited, that this ring had (as usual) made a deep impression on the finger, which was also observed on the body.

Next day, the physicians A. and B. performed the medico-legal examination of the body. They found the signs of "incipient putrefaction;" *post-mortem stains were, however, nowhere observed.* Of the borders of the shot-wounds on the head, it is said that "they are ragged, of a darkish hue, and turned inwards." The borders of the incised wounds on the face were not described in the first report; in a subsequent document, one of them is merely said to have had "smooth, bloodless edges, like those of an incision made upon a body several days after death." The colour of the skin was not mentioned in the first report (Obductions—Protocoll[1]), but in the second (Obductions—Bericht[1]) "the remarkable whiteness of the skin" is alluded to. "On the arms there were visible small, bluish-red, and swollen spots, of irregular size," which the reporters termed "sugillations." Different unusual markings, to which I shall presently direct attention,—viz., cupping scars and tattooed marks,—were not either observed on the body, or alluded to in the documents. Both medical reporters declared, at the final hearing of the cause (Audienztermin[1])—three years afterwards—in answer to repeated questioning, that *cupping marks*, had such existed, might possibly have escaped their observation; but certainly *not tattooed marks*, which must have attracted notice in the course of their protracted and careful examination of the body. The magistrates (Gerichtspersonen[1]), too, as the record of their proceedings bears, "in the course of a careful examination of the naked body for an hour, observed *no tattooing marks* on the arm. As for the internal examination of the body, I need only mention here, that it yielded no result bearing on the case more directly than the important observation of the complete and general want of blood. In their second report, the medical witnesses stated their opinion—(1), that the deceased had sustained an absolutely fatal double shot-wound in the skull, and met his death in consequence; (2), that the removal of the head was subsequently effected by means of a cutting instrument, skilfully used; and (3), that the removal of the head must have taken place *immediately after death from the shot-wound.*

When the first judicial steps were taken for the identification of the unknown person of the murdered man, and for the detection of the alike unknown murderer, an unmarried woman, Gl.—who afterwards proved to be a person of very evil repute—presented herself under the assumed name of a married woman, and asserted that the description of the body given in the newspapers had awakened the suspicion that the deceased was her husband. The clothing taken from the body was laid before her, and lo! she recognised it, piece by piece, as the property of her husband, and in part as her own work. Hereupon, and nine days after the medical examination, the body was disinterred (for the first time), and the woman recognised it positively (by the genitals! among other marks), as the body of her husband. The result of inquiries, which were immediately and most carefully made, proved that there never had been such a husband in existence. It was not made perfectly clear whether this woman was of weak intellect, or a cunning deceiver, perhaps interested in the profits of the robbery and murder. The incident was and remains an episode in the fearful drama, destined to be followed by several others.

In further investigating the case, several grounds seemed to indicate that the *murderer* of the unknown individual was a cattle-dealer, named Gottlieb Ebermann, a dangerous criminal, for whose apprehension warrants had been formerly

[1] We give the German terms, not being enabled to find their technical significance in English law phraseology.—*Editor.*

issued; and the magistrate who conducted the inquiries accordingly publicly offered a reward for his capture. This suspicion did not subsequently gain force; on the contrary, as we shall afterwards find, the accumulation of additional evidence substituted for it the exceeding probability that Ebermann was the *murdered man!* Certainly an unheard-of case in the annals of criminal trials! The doubts as to the identity of the body with the person of Ebermann were, however, originally and continued so considerable, that the determination of this point occupied half the time of the long sitting of the court, and in consequence of the obstinate lying and silence of the former postilion, Schall (a notorious poacher and very dangerous highwayman, to whom the crime was, after many long attempts, brought home), exercised the utmost ingenuity of the president of the court, and of the counsel both for the prosecution and defence. My own assistance was called in at this juncture. But, before proceeding to my own evidence, or to the proper subject of this treatise, which it includes, I shall make a few cursory observations. It became afterwards known that Ebermann, while alive, had cupping marks on one of his wrists, and a *red heart* and *the letters* G. E. (his initials) tattooed upon his left fore-arm. Thus one witness, a long time before, had seen the tattooing on Ebermann while bathing; and two surgeons of Mecklenburg—one of whom had cupped the deceased, and the other several times bled him at the arm—both deponed, that at the times when they last saw Ebermann—*i. e.*, respectively eight to nine, and three to four, years before—they had remarked the tattooing on his arm. But Ebermann's three married sisters and his wife, when examined, stated that they had never observed the tattooed marks. The last witness had been married to him only for a short time, and even during that period had been for the most part separated from him while he was undergoing imprisonment in jail: she asserted, however, on oath, that very lately she must have observed any such marks, for that her husband was both a poacher and highwayman; that she helped him to clean his arms, and used to turn back and bind up his shirt-sleeves, preparatory to this occupation. At this period of the trial, although the medical witnesses had, as we have above stated, affirmed positively that they had seen no tattooing marks on the body, it was thought essential to justice to disinter the body again. This was done on the 13th February 1850, consequently five months after death, in presence of the medical witnesses. The medical report, however, bore, that "decomposition was already too far advanced to permit cupping or tattooing marks to be made out on the body, and that none such were visible."

Meanwhile the report was spread, that Ebermann was alive still, and had been seen! In following out this rumour, its source was arrived at in the witness N. He told with much simplicity how he had gone to see Ebermann,—had spoken to him, but without obtaining any answer, etc. It soon turned out that this man was a *ghost-seer*, who with the utmost earnestness assured his auditors that he had likewise seen and conversed with a burgomaster, who had been long dead, and at whose funeral he had himself, by his own admission, assisted. This was a new episode!

Ebermann's mistress, an unmarried woman, named N., to whose evidence great importance was now attached, declared positively, that the short stick found stuck in the earth near the body was the property of Schall—a man of about five feet four inches high,—and that the long stick, found with other property of Ebermann's in Schall's house, was the stick of her deceased paramour, a man of greater stature, about five feet eight inches high. She had further recognised all the articles of clothing found on the body as Ebermann's; and in the prosecution of the inquiry, added, that his teeth were so unusually broad and long, that she could recognise them if placed before her. In consequence of the ever-recurring doubts as to the identity of the body, it was deemed expedient to exhume the head again on the 11th December 1851 (third disinterment!), and H. now recognised, in the most positive manner, the teeth in the lower jaw, which were perfectly entire, as also what remained of the reddish beard, which, curiously enough, still were attached to the denuded bone, as belonging to her paramour

Ebermann. (In the course of one of the hearings of the case, the president of the court called upon me to compare these teeth with those of Ebermann's brother. I reported that there was certainly a resemblance between them, but that I could deduce no inference from the observation.) On the 12th August 1851, a murderous attempt on the life of the witness N. was made by an unknown hand, very probably, however, as she asserts, by a notorious associate of Schall, now in prison. Episode the third!

The wife of Ebermann recognised with distinctness the different portions of clothing found with the body, not only as the property of her husband, and in part made by herself; but, in particular, the wedding ring, marked with her initials, which, as above mentioned, had caused an indentation on the finger, as the ring which she had changed with Ebermann at her marriage. Her own ring, marked with Ebermann's initials, and the same date, G. E. 1843, corresponded with it exactly. With equal distinctness she recognised the hairs, and the watch found in Schall's possession as belonging to her husband.

The inquiry seemed at an end, and the accused was consequently placed before the court for trial in October 1851. From the proceedings which then took place, and which I did not personally witness, I shall only extract such as are recorded in the judicial papers, and may interest the reader, as well as illustrate the subject of this communication. The first medical witness at the hearing of the 30th October, deponed, in addition to his former report, "the head must have been cut off, *immediately after death*, for a large quantity of blood has escaped from the body, which is not the case when the head is removed at a later period when the blood has become stagnant. The head *cannot* have been removed sooner, or the amount of hemorrhage would have been even greater. . . . If the clothes found had been put upon the body after death, the shirt could not have been drawn on without being made all bloody, unless it were drawn from below upwards. The shirt was not placed upon the body after death, or it must have been soiled behind, for the change of clothing must have been effected in the wet meadow." . . Cupping scars become faint in process of time, but always leave little white scars for the rest of a patient's lifetime. *When tattooing is very effectually performed, it never becomes effaced.* The depth of the punctures must be taken into account. If they are only superficial, so as only to implicate the cuticle, the tattooing assuredly becomes effaced in process of time. If one of the witnesses saw the marks on Ebermann at ten paces distance, the tattooing must have been well performed. When in cupping the operation is so performed as to cause a copious depletion, durable scars, which never become obliterated, are the consequence.

The second medical witness declared, on this head, "Cupping scars may vanish, if the scarification has been superficial, in a few years, perhaps in two or three years. As for *tattooing*, I can give no decided opinion."

Circumstances occurred which caused an adjournment of the trial, and on the 1st March 1852 this important case was again submitted to a jury. As already remarked, the advocate for the Crown wished me to be called as an expert (Sachnerständiger). From his letter to me of the 27th February I extract the following passages. "The points to which you must specially attend are the following:—*a*. The body of Ebermann was found (in the condition already described). The medical men have reported, that his death was caused by the double shot-wound, which fractured the skull and injured the brain, and that the decapitation and infliction of the incised wounds took place after the death occasioned by the shot. According to this report, the cuts on the face and cutting off of the head were acts perpetrated on a dead body. Can this be with absolute certainty confirmed?

"*b*. The body was found clothed completely in Ebermann's clothes. A report has been spread, that the man presumed to be murdered still lives. In this case, Ebermann must have had some part in the murder of the 10th September 1849, and must either have put all his own clothes, shirt, stockings, etc., upon the body, or must have caused the murdered man before his death to put on his clothes. The latter supposition is quite improbable. Is it possible and

probable, looking at what the judicial proceedings contain regarding the dress of the body, that it was so attired after death?

"*c.* Witnesses of unimpeachable credit assert, that Ebermann had a red heart and letters tattooed on his left arm, also that he bore cupping marks on his nape and wrist joints. On the other hand, Ebermann's wife and relations say that they never observed on him marks of cupping or tattooing; and in the proceedings of the criminal court of Spandau the description of Ebermann is given, without allusion to tattooing or cupping marks as furnishing any means of recognising him. As the whole proceedings force on me the conviction that the body found was Ebermann's, I hold the above-mentioned medical reports, and the explanations of the two physicians, to be erroneous. Have the tattooing and cupping scars really escaped their observation?"

Never, in the course of a long series of years, rich in the practice of medico-legal investigations, have I ever felt so strongly the responsibility attaching to an opinion required of me, as in this final trial; being well aware, even without the explanations which had been made to me, that my opinion would be considered almost decisive, both as to the active and passive agents in this crime, and especially as to the doubtful identification of the murdered man, a point with which the guilt or innocence of the accused was intimately connected. And a theme was introduced on which all written authorities on medical jurisprudence, all compilations are silent, and on which I had only found a short notice in the "Dictionnaire des Sciences Médicales," which, in its article on tattooing, treats of the "caractères ineffaçables" of this operation. But perfectly at rest as to the accuracy of all the statements which I made before the jury, I now submit my evidence, premising the grounds on which it was founded, for the decision of those acquainted with the subject.

The process of tattooing, which, as is well known, is in this country practised almost exclusively by men, chiefly on the arms, but also sometimes on the breast (while certain savage nations apply it to the whole body, indicating degrees of rank by the pattern engraved), is accomplished by means of three or four sewing-needles stuck into a cork or piece of wood, and turned up at the point, which are deeply bored into the skin on which the intended pattern has been traced. Such of our men as have the taste for tattooing (almost all of the lower orders of society, such as sailors and soldiers), commonly choose as a decoration one or two hearts, their own initials, or those of their lady-love (Herzendame), a date in memorial of some remarkable occurrence, or, even as I have seen among soldiers, crossed swords or cannon, a face, an entire diminutive figure, and so forth. When the bleeding from the small punctured wounds has subsided, some coloured stuff is rubbed into the recent wounds, consisting usually of cinnabar or gunpowder, or generally of both, in order to make a pretty pigment—rarely of China ink. The common opinion is well known to be, that these marks never become effaced during life, and, consequently, not after death, and a theoretical explanation of this doctrine at once suggests itself. But this general belief can only be founded on the fact that old, even very old, people have been seen with marks of tattooing performed in their youth many years before, still distinctly visible. *Ergo!* But an *ergo* of this sort would not satisfy me in the case which was under investigation. It was necessary to attempt to discover, whether a large number of men, for instance of old soldiers, could be found, who had been tattooed at an early period of life, and then to inquire whether the marks on any of them had at a later period disappeared! For were this the case even in a single individual, the opinion would be not only justified but rendered probable, that in the case of the cattle-dealer Ebermann the tattooing might have disappeared. For my investigation, the Royal Invalid Establishment presented an admirable field; and the results I consider it my duty to detail here at length, not only on account of their novelty, but because, in the course of the trial, I considered it necessary to give a mere summary of them.

In the invalid establishment of Berlin, and with the assistance of one of my

pupils, Staff-Surgeon Dr Transfeld, I examined the following old tattooed soldiers, in number six-and-thirty :—

Name.	When, and with what, Tattooed.	Present State of Marks.
1. Stadler.	1798. Lamp black and Brandy.	Faded; on the left arm 1798 is still distinctly visible; on the right the letters S and R of Stadler distinct, T and E indistinct; nothing else visible.
2. Siedschlag.	1807. Powder and Cinnabar.	On the left arm two cannon distinct; on the right a mere bright red stain of the red heart, once distinct upon it.
3. Schlottman.	1808. Cinnabar.	J. F. A. S., very well preserved.
4. Schreiber.	1808. Powder and Cinnabar.	On left arm a black heart; the cinnabar marks have disappeared.
5. Burschinsky.	1809. Cinnabar.	M. B. and two sabres very well preserved.
6. Klatt.	1809. Do.	A heart and 1809, much faded.
7. Senfft.	1811. Cinnabar and Powder.	Tattooed in Spain; very well preserved.
8. Kerl.	1811. Do.	Do. Do.
9. Korthaus.	1813. Cinnabar.	Well preserved.
10. Beyser.	1813. Cinnabar and Powder.	Heart and letters, very well preserved.
11. Tapper.	1813. Cinnabar.	Well preserved.
12. Hanne.	1814. Do.	A heart on the left arm remained visible for two or three years, and then totally vanished; at present there is not a trace visible.
13. Albrecht.	1814. Do.	On the left arm a little soldier; on the right E. A. and a heart, distinctly visible.
14. Ribenhausen.	1814. Do.	Well preserved.
15. Hesselbach.	1814. Do.	Good and distinct.
16. Steinert.	1814. Cinnabar and Powder.	Figures, numbers, and letters, well preserved on both arms.
17. Meissner.	1814. Cinnabar.	Very distinct.
18. Zappe.	1815. Cinnabar and Powder.	Well preserved.
19. Schulz.	1815. Cinnabar.	F. A. S. and a heart, very distinctly visible.
20. Lehmann.	1815. Powder.	Well preserved.
21. Kolenz.	1815. Cinnabar.	Much faded.
22. Batzlaff.	1816.	Heart and 1816 lasted only two or three years; at present no trace of tattooing visible.
23. Pluta.	1817. Do.	Well preserved.
24. Giesler.	1817. Cinnabar and Powder.	Signature distinct.
25. Marschner.	1817. Cinnabar.	Well preserved.
26. Grandscheck.	1818. Do.	Do.
27. Pitsch.	1820. Do.	Do.
28. Schmidt.	1822. Do.	Rather faint.
29. Schröder.	1823. Cinnabar and Powder.	Well preserved.
30. Krisek.	1825. Cinnabar.	Do.

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Name.	When, and with what, Tattooed.	Present state of Marks.
31. Stein.	1825. Cinnabar.	Well preserved.
32. Schmidt.	1831. Do.	Do.
33. Hofbauer.	1837. Do.	Do.
34. Bölke.	1841. Do.	Do.
35. Schmidt, II.	1845. Do.	Do.
36. Meissner.	Red ink (?)	The tattooing (on right fore-arm) was destroyed by suppuration in six weeks after the operation; it has now disappeared, and left no trace behind.

These facts are very surprising! While in case 1, after the lapse of fifty-four years, there are still at least some tattooed marks distinctly visible, they have perfectly faded in cases 12 and 22, after the respective periods of thirty-eight and thirty-six years; while in several other instances they are still quite distinctly visible after more than forty years. That the material used causes no difference in this respect, is proved by a glance at our table; No. 36 must be excluded, in which the tracing was effected with red ink. But it is far from certain, "that the depth of the punctures in tattooing," on which the first medical witness gave an opinion (erroneous, yet in the circumstances excusable), can cause the difference in durability; for in cases, such as that marked 22, in which the tattooing remains for several years, and then disappears, any other supposition may be adopted than that the operation has been imperfectly performed. In general, we learn from our cases that in *three* (Nos. 6, 21, and 28) out of thirty-six, the marks faded in process of time, that in *two* others they became partially (Nos. 1 and 2), and in *four* perfectly obliterated (Nos. 4,[1] 12, 22, and 26).

Consequently, since in one of every nine cases the tattooing had disappeared in process of time, it may also have faded on Ebermann's body during life, and hence not been visible after death. My answer to the question put could not consequently be doubtful. Founding upon my observations, and relating them, I accordingly asserted with confidence, *that tattooed marks may disappear*, and hence the most important *doubt as to the identity of the body of the murdered man was removed.* It was likewise instructive for those engaged in, and present at, the trial, that in the course of the proceedings there came forward a witness, belonging to the more educated class, who distinctly related, how in his fifteenth year he had had his left arm tattooed with cinnabar, and how the marks had in a few years faded. I examined the arm in open court, and there were *no traces of tattooing* upon it—a point on which judge and jury likewise satisfied themselves. As for the cupping marks, I must, however, dismiss the question of their existence or non-existence on the body. They might indeed have been quite appreciable, and yet overlooked by the medical witnesses, and nothing is more explicable and excusable in a case where the cause of death was so apparent, and in which the marks (which when old are difficult to see upon a dead body), were situated in so unusual a region as the back of the wrist.

A second point referred to me (see above) was this:—Whether, as the medical evidence bore, it could, with absolute certainty, be affirmed that the separation of the head from the trunk, and infliction of wounds on the face, took place after death had been caused by the shot? To my sorrow I was obliged, in making my statement on this head before the jury, to preface it with a critique of the medical evidence, which, although upon the whole creditable, yet in many points more or less important, was defective. We had not been informed of the state of the throat, genitals, trachea, larynx, œsophagus, etc. The medical witnesses had positively affirmed that no post-mortem staining was visible on the body. But as they had reported that the signs of "incipient putrefaction" were present,

[1] In this case at least cinnabar had been used.

I was compelled to differ from them here, inasmuch as post-mortem stains are well known to be the first and never-failing sign of "commencing putrefaction," and when once formed never vanish, but rather continue distinct till the body can no longer be recognised. Hence such stains *must have* existed on the body of Ebermann. Another and more suggestive conclusion of the witnesses, I was obliged to dispute. They had spoken of suggillations on the foot and arm of the deceased, "as if the murdered man had been firmly grasped by some one by these parts;" and Schall's counsel had endeavoured to found a part of his defence upon this statement, as it would seem to lead to the conclusion, that at least several persons had taken part in the crime; and hence, that what passed on that occasion was different from what the indictment alleged. For my own share, I could not on oath accept the statement, that true bruises had been observed on the body; for it was justified by nothing else than the assertion of the medical witnesses—their opinion unconfirmed by facts or proper post-mortem examination of the parts. Neither the preliminary nor the subsequent reports (Obductions-Protocoll und Obductions-Berichte) made mention of any examination of the so-called *suggillations* with the knife—the only criterion by which bruises can be distinguished from post-mortem staining, blood being in the former case found extravasated in the subcutaneous cellular tissue, which in post-mortem staining is never observed.

Hence I declared that there was no proof that "suggillations" had existed on the body; and hence, that all conclusions based upon the alleged existence of these suggillations were destitute of scientific value. The defender now forsook this part of his defence. Medical jurists may, however, take warning from this apparently trifling circumstance, which, in the criminal trial in question, assumed such high importance, and learn how careful should be their conduct in performing the medico-legal examination of a dead body.

Could it now be affirmed, "with absolute certainty," that the cuts on the face were inflicted after death? By no means. However improbable the contrary—for it must have been very difficult to cut with a knife, as in a scuffle or fight, the face of the tall and powerful Ebermann, unless he were fast asleep—"certainty" on this point could only have been attained if the margins of the incisions had been examined and accurately described. The first report (Obductions-Protocoll) left us here completely in the dark; for it only described the borders of the gunshot-wound, which was hence shown to have been inflicted during life, without a syllable of description of the edges of the incised wounds of the face! Hence, that these wounds had been inflicted on a dead body was not only uncertain, but could not even be asserted. Was a surer basis for opinion furnished by the proceedings of the inquest (Obductions-Verhandlungen) relative to the separation of the head from a living or dead body? If my conclusions on this head were directly opposed to those of the medical witnesses, I at least never entertained a moment's doubt as to their correctness. These witnesses had with great care noted the fact of excessive *bloodlessness* (Blutleere) of the whole body, including all its separate organs. We may remark in passing, that this condition could not be attributed to advanced putrefaction, of which anæmia is a never-failing accompaniment,—for the dissection was performed only two days after the murder. Besides, as the proceedings showed, on the spot where the body of the murdered man was found, a great puddle of blood (Blutlache) was visible on the grass. That this quantity of blood could not have flowed from the body through the shot-wound, which, from the consequent destruction of the head, must have caused death much more rapidly than could have taken place by hemorrhage, is indubitable. But this absolutely anæmic condition of the body becomes more explicable, if it be assumed that the head was cut off while the heart still continued to beat,—*i.e.*, *while the man was still alive*, and in the condition of one mortally wounded; while, if we suppose the removal of the head to have been effected when circulation had ceased, and the man was dead, it is impossible to account for the amount of blanching of the body and of organs like the lungs—of which the medical witnesses affirm, that they were perfectly void of blood and

(air?)—of the liver, kidneys, etc. The grounds—not very clearly expressed—on which these witnesses formed a contrary opinion (see p. 305), viz. that the head was cut off immediately *after* death might be regarded as insufficient, and I confidently asserted that the deceased, mortally wounded no doubt by the double gunshot-wound, was *still alive* when his head was severed from his body. Such cannibal-like bloodthirstiness is perhaps unparalleled in the annals of criminal jurisprudence; and, on psychological grounds, it might have been permitted to doubt (had not excellent grounds for a contrary opinion existed) whether an accountable human agent could have perpetrated such cruelty; but the Crown counsel said very truly in the course of his able pleading, while describing the personal character and antecedents of the poacher Schall,—"Roebuck or man, 'tis all one to him" (Rehbock oder Mensch, das gilt ihm gleich).

"Is it possible or probable to assume, in accordance with the written evidence, that the body was after death dressed up in the articles of clothing found upon it?" On this last of the three principal questions addressed to me, there was, as is obvious, little to say in a medico-legal point of view. I had only to call the attention of the court to the subject of cadaveric rigidity. I consequently reminded the jury, that bodies are, as is well known, every day stripped, washed, and then completely clothed again in male or female attire, including even uniforms, gloves, and so forth. This can, however, only be done either very soon after death, and before the stiffening has taken place, which is accomplished at periods varying from six to eight, and twenty-four to thirty hours after death, or after the subsequent cessation of rigidity and restoration of flaccidity of the body, an event which is not usually observed for several days after the rigidity of death has set in. I consequently left it for the consideration of the court,—whether the great improbability could be accepted, that the murderer or murderers had stripped the body instantly after the murder, and then dressed it completely in Ebermann's clothes;—in which case, as the bleeding does not cease immediately with life, the articles of clothing would have been of necessity far more soiled with blood than reality showed,—or whether they could admit the far more improbable supposition, that the murderers (several days after the stiffening of the body) returned to the spot where the deed was committed, and now undressed and dressed the body, which had meanwhile become pliant.

"In resumé, I may sum up my evidence on the points submitted to me at the final trial, as follows:—

"1. Contrary to the medical evidence, there must have been death-stains on Ebermann's body.

"2 Contrary to the same evidence, I hold it not proved that there were 'sugillations' on this body.

"3. Contrary to the same evidence, it is *not* shown that the incised wounds on the head were inflicted after death.

"4. It cannot be assumed (as the same witnesses hold) that the head was severed from the trunk after death; on the contrary, it must rather be assumed, that Ebermann still lived when his head was being cut off.

"5. I agree with the witnesses, that the clothing was not put on the body after death.

"6. *Marks of tattooing may become effaced during life.*

"The jury declared, 'by more than seven voices' (their written verdict says, *unanimously*), the postilion Franz Schall *guilty* of having, between the evening of September 9 and noon of September 10, with the previous intention of killing the cattle-dealer, Gottlieb Ebermann, inflicted on him such injuries as in the ordinary and commonly known course of events must cause death,—and hence of having murdered the deceased;" and the sentence awarded by the court, after this verdict, was death by decapitation.

Note by Translator.—In the account above given of this very curious trial, we have followed, perhaps too closely, Casper's own words. Still, we confess

our utter ignorance of all the technicalities of Prussian criminal law, and may, consequently, have confounded the proceedings and persons of the coroner and his jury, with those of the judge and jurymen at the trial for murder. In a medical point of view, such mistakes are probably of little consequence.

OBSERVATIONS UPON A GENERAL METHOD FOR DETECTING THE ORGANIC ALKALOIDS IN CASES OF POISONING. BY PROFESSOR STAS, OF BRUSSELS.

Whatever certain authors may have said on the subject, it is possible to discover in a suspected liquid all the alkaloids, in whatever state they may be. I am quite convinced that every chemist who has kept up his knowledge as to analysis, will not only succeed in detecting their presence, but even in determining the nature of that which he has discovered, provided that the alkaloid in question is one of that class of bodies, the properties of which have been suitably studied. Thus he will be able to discover conia, nicotine, aniline, picoline, petinine, morphine, codeine, narcotine, strychnine, brucine, veratrine, colchicine, delphine, emetine, solanine, aconitine, atropine, and hyoscyamine. I do not pretend to say that the chemical study of all these alkaloids has been sufficiently well made to enable the experimenter who detects one of them to know it immediately, and affirm that it is such an alkaloid, and not such another. Nevertheless, in those even which he cannot positively determine or specify, he may be able to say that it belongs to such a family of vegetables,—the Solanaceæ, for example. In a case of poisoning by such agents, even this will be of much importance. The method which I now propose for detecting the alkaloids in suspected matters, is nearly the same as that employed for extracting those bodies from the vegetables which contain them. The only difference consists in the manner of setting them free, and of presenting them to the action of solvents. We know that the alkaloids form acid salts, which are equally soluble in water and alcohol: we know also that a solution of these acid salts can be decomposed so that the base set at liberty remains either momentarily or permanently in solution in the liquid. *I have observed that all the solid and fixed alkaloids above enumerated, when maintained in a free state and in solution in a liquid, can be taken up by ether when this solvent is in sufficient quantity.* Thus, to extract an alkaloid from a suspected substance, the only problem to resolve consists in separating, by the aid of simple means, the foreign matters, and then to find a base which, in rendering the alkaloid free, retains it in solution, in order that the ether may extract it from the liquid. Successive treatment by water and alcohol of different degrees of concentration, suffices for separating the foreign matters, and obtaining in a small bulk a solution in which the alkaloid can be found. The bicarbonates of potash or soda, or these alkalies in a caustic state, are convenient bases for setting the alkaloids at liberty, at the same time keeping them wholly in solution, especially if the alkaloids have been combined with an excess of tartaric or of oxalic acid.

To separate foreign substances, animal or otherwise, from the suspected matters, recourse is commonly had to the tribasic acetate of lead, and precipitating the lead afterwards by a current of sulphuretted hydrogen. As I have several times witnessed, this procedure has many and very serious inconveniences. In the first place, the tribasic acetate of lead, even when used in large excess, comes far short of precipitating all the foreign matters; secondly, the sulphuretted hydrogen, which is used to precipitate the lead, remains in combination with certain organic matters which undergo great changes by the action of the air and of even a moderate heat; so that animal liquids which have been precipitated by the tribasic acetate of lead, and from which the lead has been separated afterwards by hydrosulphuric acid, colour rapidly on exposure to the air, and exhale at the same time a putrid odour, which adheres firmly to the matters which we extract afterwards from these liquids. The use of a salt of lead presents another inconvenience, viz., the introduction of foreign metals

into the suspected matters, so that that portion of the suspected substance is rendered unfit for testing for mineral substances. The successive and combined use of water and alcohol at different states of concentration permits us to search for mineral substances, whatever be their nature, so that in this way nothing is compromised, which is of immense advantage when the analyst does not know what poison he is to look for.

It is hardly necessary to say that in medico-legal researches for the alkaloids, we ought never to use animal charcoal for decolorising the liquids, because we may lose all the alkaloid in the suspected matters. It is generally known that animal charcoal absorbs these substances at the same time that it fixes the colouring and odoriferous matters.

[This is no doubt true; we must not use animal charcoal to decolorise, and then look for the alkaloid in the *liquid*, but we may use it, at least in the case of strychnia and some of the non-volatile alkaloids, to separate them, and then we look for them *in the charcoal*. See notice of Graham and Hoffmann's Process for Detecting Strychnia: Monthly Journal, August 1852, p. 140.]

The above observations do not proceed from speculative ideas only, but are the result of a pretty long series of experiments which I have several times employed for discovering these organic alkaloids. To put in practice the principles which I have thus explained, the following is the method in which I propose to set about such an analysis:—I suppose that we wish to look for an alkaloid in the contents of the stomach or intestines; we commence by adding to these matters twice their weight of pure and very strong alcohol;[1] we add afterwards, according to the quantity and nature of the suspected matter, from 10 to 30 grains of tartaric or oxalic acid,—in preference, tartaric; we introduce the mixture into a flask, and heat it to 160° or 170° Fahrenheit. After it has completely cooled, it is to be filtered, the insoluble residue washed with strong alcohol, and the filtered liquid evaporated in vacuo. If the operator has not an air-pump, the liquid is to be exposed to a strong current of air at a temperature of not more than 90° Fahrenheit. If, after the volatilisation of the alcohol, the residue contains fatty or other insoluble matters, the liquid is to be filtered a second time, and then the filtrate and washings of the filter evaporated in the air-pump till nearly dry. If we have no air-pump, it is to be placed under a bell-jar over a vessel containing concentrated sulphuric acid. We are then to treat the residue with cold anhydrous alcohol, taking care to exhaust the substance thoroughly; we evaporate the alcohol in the open air at the ordinary temperature, or still better, in vacuo; we now dissolve the acid residue in the smallest possible quantity of water, and introduce the solution into a small test-tube, and add little by little pure powdered bicarbonate of soda or potash till a fresh quantity produces no farther effervescence of carbonic acid. We then agitate the whole with four or five times its bulk of pure ether, and leave it to settle. When the ether swimming on the top is perfectly clear, then decant some of it into a capsule, and leave it in *a very dry place* to spontaneous evaporation.

Now, two orders of things may present themselves: either the alkaloid contained in the suspected matter is liquid and volatile, or solid and fixed. I shall now consider these two hypotheses.

Examination for a Liquid and Volatile Alkali.

We suppose there exists a liquid and volatile alkaloid. In such a case, by the evaporation of the ether, there remains in the inside of the capsule some small liquid striæ which fall to the bottom of the vessel. In this case, under the influence of the heat of the hand, the contents of the capsule exhale an odour more or less disagreeable, which becomes, according to the nature of the alkaloid, more

[1] When we wish to look for an alkaloid in the tissue of an organ, as the liver, heart, or lungs, we must first divide the organ into very small fragments, moisten the mass with pure strong alcohol, then express strongly, and by further treatment with alcohol exhaust the tissue of everything soluble. The liquid so obtained, is to be treated in the same way as a mixture of suspected matter and alcohol.

or less pungent, suffocating, irritant; it presents, in short, a smell like that of a volatile alkali masked by an animal odour. If we discover any traces of the presence of a volatile alkaloid we add then to the contents of the vessel, from which we have decanted a small quantity of ether, one or two fluid drachms of a strong solution of caustic potash or soda, and agitate the mixture. After a sufficient time, we draw off the ether into a test-tube; we exhaust the mixture by two or three treatments with ether, and unite all the ethereal fluids. We pour afterwards into this ether, holding the alkaloid in solution, one or two drachms of water, acidulated with a fifth part of its weight of pure sulphuric acid, agitate it for some time, leave it to settle, pour off the ether swimming on the top, and wash the acid liquid at the bottom with a new quantity of ether. As the sulphates of ammonia, of nicotine, aniline, quinoleine, picoline, and petinine, are entirely insoluble in ether, the water acidulated with sulphuric acid contains the alkaloid in a small bulk, and in the state of a pure sulphate; but as the sulphate of conia is soluble in ether, the ether may contain a small quantity of this alkali, but the greater part remains in the acidulated watery solution. The ether, on the other hand, retains all the animal matters which it has taken from the alkaline solutions. If it on spontaneous evaporation leaves a small quantity of a feebly-coloured yellowish residue, of a repulsive animal odour, mixed with a certain quantity of sulphate of conine, this alkaloid exists in the suspected matter under analysis. To extract the alkaloid from the solution of the acid sulphate, we add to the latter an aqueous and concentrated solution of potash or caustic soda, we agitate and exhaust the mixture with pure ether; the ether dissolves ammonia, and the alkaloid is now free. We expose the ethereal solution at the lowest possible temperature to spontaneous evaporation; almost all the ammonia volatilises with the ether, whilst the alkaloid remains as residue. To eliminate the last traces of ammonia, we place for a few minutes the vessel containing the alkaloid in a vacuum over sulphuric acid, and obtain the organic alkaloid with the chemical and physical characters which belong to it, and which it is now the chemist's duty to determine positively.

I applied, on the 3d March 1851, the process which I have described, to the detection of nicotine in the blood from the heart of a dog poisoned by two cubic centimetres [0·78 C.I.] of nicotine introduced into the œsophagus, and I was able in a most positive manner to determine the presence of nicotine in the blood. I was able to determine its physical characters, its odour, taste, and alkalinity. I succeeded in obtaining the chloro-platinate of the base perfectly crystalised in quadrilateral rhomboidal prisms of a rather dark yellow colour, and to ascertain their insolubility in alcohol and ether.

I have applied the same process for the detection of conia in a very old tincture of hemlock, which my friend and colleague M. De Hemptinne was so kind as to put at my disposal; and I was equally successful in extracting from the liquid colourless conia, presenting all the physical and chemical properties of this alkali. I was also able to prove that the ether which holds conia in solution, carries off a notable portion of this alkaloid when the solvent is exposed to spontaneous evaporation.

Examination for a Solid and Fixed Alkaloid.

Let us now suppose that the alkali is solid and fixed; in that case, according to the nature of the alkali, it may happen that the evaporation of the ether resulting from the treatment of the acid matter, to which we have added bicarbonate of soda, may leave or not a residue, containing an alkaloid. If it does, we add a solution of caustic potash or soda to the liquid, and agitate it briskly with ether. This dissolves the vegetable alkaloid, now free and remaining in the solution of potash or soda. In either case, we exhaust the matter with ether. Whatever be the agent which has set the alkaloid free, whether it be the bicarbonate of soda or potash, or caustic soda or potash, it remains, by the evaporation of the ether, on the side of the capsule as a solid body, but more commonly a colourless milky liquid, holding solid matters in suspension. The odour of the

substance is animal, disagreeable, but not pungent. It turns litmus paper permanently blue.

When we thus discover a solid alkaloid, the first thing to do is to try and obtain it in a crystalline state, so as to be able to determine its form. Put some drops of alcohol in the capsule which contains the alkaloid, and leave the solution to spontaneous evaporation. It is, however, very rare that the alkaloid obtained by the above process is pure enough to crystallise. Almost always it is soiled by foreign matters. To isolate these substances, some drops of water, feebly acidulated with sulphuric acid, are poured into the capsule, and then moved over its surface, so as to bring it in contact with the matter in the capsule. Generally we observe that the acid water does not moisten the sides of the vessel. The matter which is contained in it separates into two parts, one formed of greasy matter, which remains adherent to the sides,—the other alkaline, which dissolves and forms an acid sulphate. We cautiously decant the acid liquid, which ought to be limpid and colourless, if the process has been well executed; the capsule is well washed with some drops of acidulated water, added to the first liquid, and the whole is evaporated to three-fourths in vacuo, or under a bell-jar over sulphuric acid. We put into the residue a very concentrated solution of pure carbonate of potash, and treat the whole liquid with absolute alcohol. This dissolves the alkaloid, while it leaves untouched the sulphate of potash and excess of carbonate of potash. The evaporation of the alcoholic solution gives us the alkaloid in crystals.

It is now the chemist's business to determine its properties, to be able to prove its individuality. I have applied the principles which I have just expounded to the detection of morphine, iodine, strychnine, brucine, veratrine, emetine, colchicine, aconitine, atropine, hyoscyamine,—and I have succeeded in isolating, without the least difficulty, these different alkalies, previously mixed with foreign matters.

I have thus been able to extract, by this process, morphine from opium, strychnine and brucine from nux vomica, veratrine from extract of veratrum, emetine from extract of ipecacuanha, colchicine from tincture of colchicum, aconitine from an aqueous extract of aconite, hyoscyamine from a very old extract of henbane, and atropine from an equally old tincture of belladonna. Thus it is in all confidence that I submit this process to the consideration of chemists who undertake medico-legal researches.—*Bulletin de l'Académie Royale de Médecine de Belgique.* Tom. vi., No. 2.

MIDWIFERY.

HOW TO FORM A CORRECT ESTIMATE OF THE DIMENSIONS OF THE FEMALE PELVIS. BY G. VROLIK.

Vrolik asserts that no writer on obstetrics, from J. L. Baudeloque to J. E. Rosshirt, whose works he has referred to, proceeds upon a sure principle in estimating the dimensions of the female pelvis, and, in particular, of the inlet of the lesser pelvis. On the contrary, the oblique measurements should not be taken in a direction to which it is certain that the fœtus cannot naturally be accommodated, nor should the transverse diameter be taken so far back or forwards as to bear no necessary relation to the head of the child. To exhibit that correspondence between the fœtus and the aperture necessary for the passage of the former, all the lines of diameter should, according to Vrolik, be so drawn as to intersect each other in the central point of the brim of the lesser pelvis. This holds good no less of the transversely oval and obtusely heart-shaped pelvis, than of the round pelvis of the Javanese and of some European women. The direction of the oblique diameter, in order to correspond with the place which the head must occupy at the inlet, should not be from the sacro-iliac synchondrosis to the upper part of the pectineal eminence, or ischio-pubal synostosis of the opposite side, but to a point a few lines further forward on the horizontal ramus of the pubes, *i. e.*, excluding about three-fourths of the length of the ramus. (In