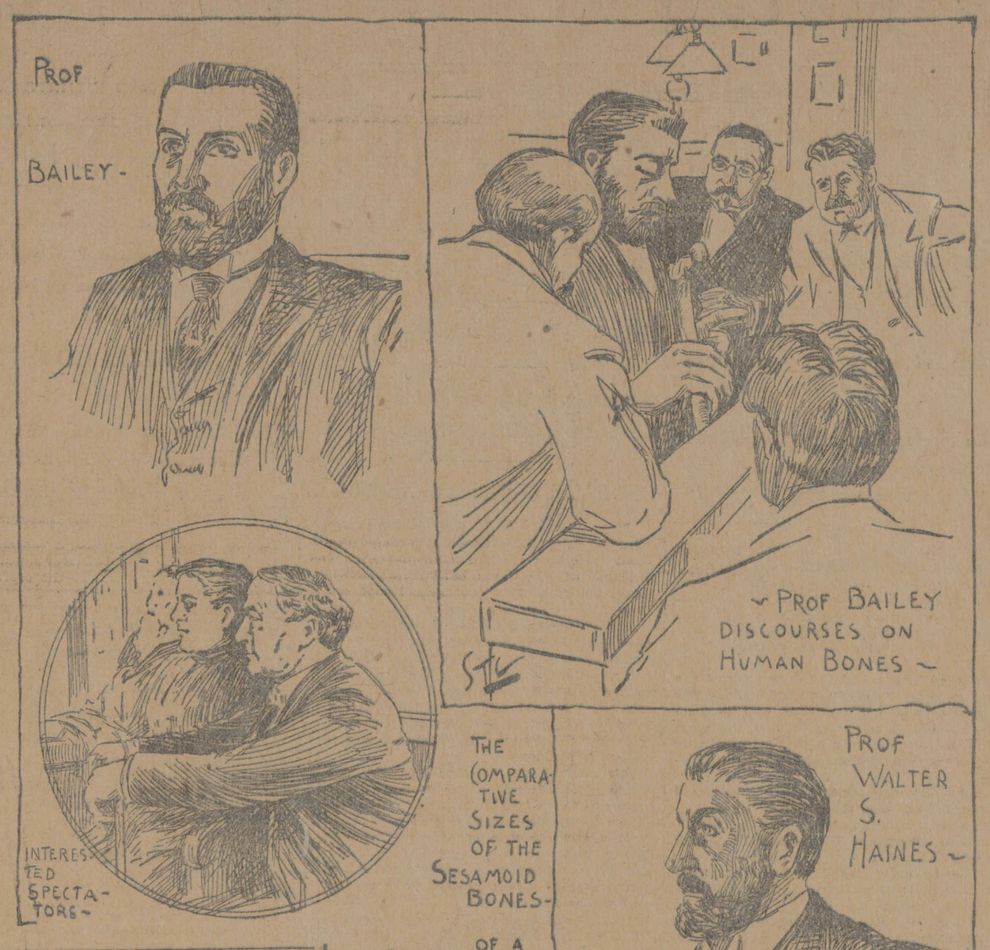
EXPERT WITNESSES HEARD IN THE LUETGERT CASE.



... would ... others. It ... intact, and the ... hands and feet would be ... The bones of the skull ... or soften. Some of them ... complete identity. The ... be much acted on.

... showed however, that if the natural teeth had begun to decay the potash would have access to the bony center of them through the enamel, and they might be easily destroyed. In any event they would become loose in the sockets.

Some Bones Would Be Preserved.

It also was shown that some bones acted on by potash would be preserved in a measure against fire, but that the majority of them attacked by the solution would burn more easily. Wood, of which the Luetgert vat is composed, would be scarcely at all affected.

Luetgert's huge jackknife was a feature of Professor Haines' testimony. He had found muscle fiber and blood on it, he said, but he could not tell whether it was human. Other witnesses will cover this point for the State.

The defense sought to show that the potash bought by Luetgert must have been greatly weakened by standing in an open barrel from March to May, but the witness said the effect would be scarcely perceptible.

Professor Haines' description of the slime that would result from the boiling of a human body agreed closely with that of Luetgert's two laborers, who described the actual stuff in the sausage vat. Professor Haines and Odorofsky stated the stuff was "slimy." Lavandowsky coined a word and called it "sleimische."

Charles Vincent Bailey, the osteologist at the Field Columbian Museum, was the last witness before court adjourned. Mr. Bailey's answers to Mr. McEwen's questions were so carefully worded and so guarded that when he did make a positive assertion of the identity of one bone it caused a sensation. He refused to swear to the identity of the finger bone which Professor Delafontaine had partly identified because it was too badly burned. It appeared to be, he said, a finger bone, but he could not say positively. Then came the identification of the sesamoid bone.

EXPERT TESTIMONY CONTINUES

Professor Delafontaine Put Through a Long Cross-Examination by Mr. Vincent.

At the opening of court the examination of Professor Delafontaine was continued. Mr. McEwen first took several pieces of bone from the receptacles in which they had heretofore been contained and placed them in four boxes, numbering them respectively 10, 11, 12, and 13.

The court—Q.—What are these little round bones? Do you know? A.—In my opinion they are human bones.

Q.—From what part of the body? A.—Some are from hands and others from the feet.

Q.—Little bones of the fingers? A.—Yes, sir. In my opinion one of them belongs to a big toe.

Mr. McEwen took up people's exhibit 12, which the witness had identified as having been found in the scrapings of the vat, and asked:

Q.—Are these the bones that you said you thought were human bones? A.—One of them is human.

Q.—Which one? A.—The round one.

Q.—I will ask you whether these bones or any of them show the presence of the potash? A.—From the fact that they are very brittle, so that we hardly dare to handle them, and the fact that one of them was broken when exhibited to one of the Judges before. I think Justice Kersten. It is evident that they have undergone a process of decomposition. I did not test them for alkali or potassium. To do so I would have to destroy them. Only I say that in general appearance and color they look like the other pieces that we had in the jar yesterday. I may say that one of them, the first one here, that was shown to me, bears the evidence of having been in contact with some alkaline matter and then thrown into a fire, because there is a glazing on part of the surface which protects the bone from crumbling so easily.

The witness had said that exhibit 10 contained small bones which had formerly been in a blue box produced from the possession of Dr. Le Count, and which the witness had received from Inspector Schaack.

Q.—Are you familiar with the human anatomy? A.—To a certain extent. I have become somewhat rusty, because I have not done anything in it for a few years.

Q.—Are you familiar enough to entertain an opinion? A.—I am of the opinion that they are human bones, and that with the exception of some flat fragments they belong to the hand or foot. Then the flat fragments I did not test for them as easily, but I believe them to be parts of a skull.

Mr. McEwen stated that he did not introduce the professor to identify them as human bones, but would produce a couple of gentlemen who make a business of such matters.

Cross-Examined by Mr. Vincent.

Mr. Vincent cross-examined the witness as follows:

Q.—I show you bone marked people's exhibit 11; what do you say about that bone? A.—That is the piece of bone that I testified about yesterday as being found among the scrapings from the vat. It was about three inches longer and broke off the moment examination.

Q.—You did not say in your opinion this was a human bone? A.—No.

Q.—You do not know what exhibit 11 is? A.—I know it is a piece of bone. That is all I know about it.

Q.—What did you say about exhibit 12? A.—They came from the mud scrapings, and the round one, in my opinion, is a human bone.

Q.—From what portion of the human anatomy in your opinion did that bone come? A.—Probably from the big toe, an additional bone called the sesamoid bone.

Q.—What do you mean by that term? A.—It is an extra bone, which is found between the big toe and the next.

Q.—How could you tell that bone from the bones of any warm blooded animal? A.—I don't know of any animal having such bones.

Q.—Do you say that no animal has a sesamoid bone? A.—I say I don't know of any animal but the human being having such bone.

Q.—Will you describe the bones of the hand? A.—I cannot describe them. I have not made a special study and have not done anything lately in that line. And except that I know there are carpal bones, and metacarpal bones, forming the palm of the hand, and the phalanges, and for the names of the special bones, I cannot give them.

Q.—Can you describe the bones of the foot? A.—In the same way as the bones of the hand, the ankle, the instep of the foot, and the toes.

Q.—How many bones are there in the foot? A.—I don't remember.

Not an Expert Anatomist.

Q.—Have you told us now all you can tell us about the bones of the hand and foot and their number? Tell everything you can about it. Describe their shape accurately. A.—I cannot. I do not pretend to be an anatomist, and I did not even expect to say this morning that these are human bones.

Q.—You did say it. A.—The question was asked me by the Judge.

Q.—Why do you say that you think those are human bones? Because I have compared them with human bones in an atlas and with some bones I know to be human, but I do not pretend to identify them, their exact location, and so forth. That work has been turned over to experts, who will say all about it.

Q.—Does every human foot have the same number of sesamoid bones? A.—I think every human foot has one sesamoid bone.

Q.—Do they never have more than one? A.—I don't know.

Q.—Do they ever have less than one? A.—I don't know.

Q.—Do you know whether every human hand has a sesamoid bone? A.—I don't know.

Q.—Don't you know that some human hands have some and some do not? A.—I don't know of any sesamoid bone in the hand.

Q.—Don't you know that some feet have several sesamoid bones? A.—I do not.

Q.—That many feet have none? A.—I do not.

Q.—You have no way of differentiating these bones with the bones of any warm-blooded animal except by comparison with an atlas? A.—We have to learn all that knowledge by seeing things or the pictures of things.

Q.—Do you mean to say that there are no sesamoid bones in any warm-blooded animal that eats substantially the same food that we do? A.—There is a possibility that some of the large monkeys have or the chimpanzee.

Q.—Will you say that with the exception of monkeys and chimpanzees and human beings there are no animals that have sesamoid bones? A.—I don't know of any.

Q.—Will you say there are no others? A.—No.

Has Made Three Experiments.

Q.—Have you ever boiled a human body in a golden vat such as described by Mr. McEwen yesterday? A.—No, sir. In no wooden vat of any kind.

Q.—How much have you experimented with human bones? A.—Ewen—In what way?

A.—Vincent—In any way. Boiled them, burned them or anything of that kind in line with his inquiry yesterday.

A.—Witness—I don't know how much I have attempted with bones in the course of forty years.

Q.—Have you ever had occasion to boil any bones in a solution of crude potash before the month of May of this year? A.—No, sir.

Q.—Have you experimented with bones of any of the human body in a solution of crude potash since May of this year; I mean much or little? A.—Three experiments.

Q.—Were any of those experiments been made in a golden vessel where the heat was applied by means of a steam pipe? A.—No, sir.

Q.—How many of these three experiments you specified to have been made with the bones of the human beings? A.—One.

Q.—You please state why the bones of a female would be destroyed more easily by the action of crude potash than the bones of a male? A.—Everything being equal, I think the bones of a woman would be more completely decomposed than those of a male.

Q.—For what reason I have no theory to offer, I probably because the bones are lighter in impact.

Q.—You know what the relative weights are in proportion of a human female compared to those of a human male? A.—No, sir.

Q.—Never weighed them or made any entry in that respect? A.—No, sir.

Q.—I understand you to state that the bones are more compact than those of a woman? A.—I say the reverse.

Q.—Part of a test for phosphoric acids did you make? A.—The usual test. I burned a given quantity of sawdust, dissolved the ash in a glass, added strong nitric acid and filtered.

Q.—Did you do determine the amount of phosphoric acid? A.—Take a given weight of the ash, say a half a drahm or so, dissolve it in the acid, and test in a tube—that is, a graduated, closed tube, and after several hours I judge from the thickness of the sediment in the bottom, approximately or comparatively, whether that substance contains more or less phosphoric acid than another substance taken for comparison.

Kind of Sawdust Used.

Q.—What kind of sawdust was this? A.—It was partly charred.

Q.—What kind of wood was it from? A.—I don't know.

Q.—What did you discover that made you say that the amount of phosphoric acid was abnormal? A.—It is the comparison with the ash of wood.

Q.—What wood? A.—A piece of pine.

Q.—Then you compared the ashes with the ashes of pine wood, did you not? A.—Partly.

Q.—Did you compare them with anything else? A.—No.

Q.—The amount of phosphoric acid in ashes might be affected might it not, by the kind of wood which had been burned? A.—I don't know.

Q.—If, then, the ashes which you examined were ashes obtained from burned hardwood, your comparison was not a fair one, was it? A.—I don't know.

Q.—What is the average amount of phosphoric acid in ashes obtained by burning hardwood? A.—I don't remember the figures.

Q.—Do you know what the average amount of phosphoric acid is that is obtained from ashes derived from burning soft wood, pine for instance? A.—No.

Q.—Then how did you arrive at the conclusion which justifies you in saying that the amount of phosphoric acid was abnormally large? A.—I think I have described the experiment.

Q.—I am asking you why it is that you say that the amount of phosphoric acid was abnormal, but you do not know what the amount of phosphoric should be, either in hard wood or in soft wood? A.—I made the statement that it was a comparative experiment with charred sawdust, a given weight of it being consumed, and the ashes tested for phosphoric acid, and an equal weight of acid from that wood which I first charred. I want to make it clear that I first charred wood and took a given weight, and from that amount of ash by comparison I saw that there was much more phosphoric acid in one than in the other.

Q.—How much phosphoric acid did you find in the wood that you charred yourself? A.—I did not weigh it.

Q.—How much phosphoric acid did you find in the ashes that were sent to you from the sausage factory? A.—I don't know.

The witness stated further in cross-examination that he was employed by the State's Attorney to make the tests.

Access to the Exhibits.

Q.—Who had access to the different exhibits about which you have testified? A.—After I got them they were before Justice Kersten and Judge Gibbons, and probably the experts, the Court, and Mr. McEwen had access to part of them. Since then I have given some to Professor Haines for examination and some to Dr. Gibson, and the bones were given by me to Dr. Le Count.

The witness testified that after receiving the articles at his home they were kept under lock and key and no one had access to them except himself, and that in addition to being locked up they were hidden in bookcases, behind books, in cases where chemicals were kept, behind bottles, and under shelves, and that when he made his tests he did all his work alone.

The test of liquids in two different bottles was brought out, the witness saying he had made an examination to determine its general character.

Q.—Is it not a fact that potassium and sodium are found in all animals? A.—All animals.

Q.—Is lithium peculiar to human beings? A.—I think not.

Q.—You said yesterday that you found that the coloring matter was decomposed Bismarck brown, did you not? A.—I did.

Q.—How did you find that the matter was decomposed Bismarck brown? A.—Because Bismarck brown is soluble in cold water, and forms a bright red liquid, and the decomposed Bismarck brown that I spoke of is Bismarck brown after it has been treated with an alkali, which changes its nature, as is shown, for instance, by the fact that it is hardly soluble at all in water, but readily soluble in alcohol.

Q.—Did you make any test to prove that? A.—Yes, sir. Decomposed pure Bismarck brown, boil it, examined the sediment, and that is the product of the decomposition, and found that it is hardly soluble in cold water, but quite soluble in alcohol. I also tested it with ether, and found that Bismarck brown hardly dissolves in ether, but if you add to it one or two drops of an alkaline, then it dissolves and forms a yellowish liquid.

The witness explained in detail what Bismarck brown was, that it was of mineral origin, and came from coal tar indirectly.

Q.—I understood you to say yesterday that your test actually disclosed the presence of alkaline hematin. What does the presence of hematin prove? A.—Blood.

Q.—Isn't it a fact that you find it in the blood of every warm blooded animal? A.—Yes, sir.

Use of the Spectroscope.

The witness detailed at length the use of the spectroscope in the test for alkaline hematin.

Q.—You spoke in your testimony yesterday about certain bones which were submitted to you being found deficient in animal matter. If you boil bones in pure water long enough won't you remove all traces of animal matter? A.—No.

Q.—Don't you boil them in pure water long enough won't you practically reduce or remove all traces of animal matter? A.—Yes.

Q.—What per cent of animal matter can you remove by boiling bones in pure water? A.—I don't know.

Q.—Will not boiling the bones in pure water render them brittle? A.—I have seen soup bones many times made into bones, but I never noticed that they were quite brittle.

Q.—Have you ever boiled any other bones in pure water? A.—Yes, sir; many times.

Q.—Does the boiling of bones in pure water render them brittle? A.—No. I have boiled the bones of quite a number of animals and removed the flesh, and I never found that they became brittle by the process.

Q.—You didn't boil them very long to do that, did you? A.—Some two or three hours.

Q.—If you boil them for some two or three hours and allowed to remain in pure water for two or three weeks they would be brittle, would they not? A.—I don't know, I never tried it.

Q.—Have you any account for the condition of these bones by the action of any other liquid than a solution of crude potash? A.—No, sir.

Q.—Did the liquid which you analyzed contain caustic potash? A.—Caustic potash? A.—Not from the fact that it gave potassium and sodium, and that it had an alkaline reaction, it is presumable that it contained in a very diluted form some potash.

Q.—Was that fresh in a sufficient state of preservation for you to identify from what animal it came? A.—No. I didn't try.

Q.—Would there be any difference, in your opinion, in the temperature obtained when the top of the vat was covered with doors and gunny sacks and when it was not? A.—I don't think it would make a great difference. Perhaps a few degrees. I don't think it would be material.

Test of Boiling a Human Body.

Q.—If a human body were boiled in such a vat as I have that described, with the top covered, would not the condensation of steam continually increase the amount of liquid in the vat, and thus dilute the strength of the liquid? A.—If the covering is perfectly tight it will.

Q.—Would doors and sacks put on the top of such a vat be tight enough to keep the condensing steam? A.—No.

Q.—The steam would escape under such circumstances? A.—Some of it, at least.

Q.—If there was one-half of 1 per cent of mineral matter, inorganic matter, in that vat, that would weigh about thirty-one pounds, wouldn't it, a little over? A.—I think so.

Q.—Can you tell how much water must have gone into this vat, assuming it was put in through a hose in the vat, and run over the top, and down to the sewer, to dilute these 378 pounds of crude potash down to thirty-one pounds of crude potash? A.—I don't know.

Q.—This stuff is all in solution is it not, and it would run over the top, just as well as it would through the bottom, wouldn't it? A.—I don't think it is all in the solution.

Q.—Where 378 pounds of crude potash is put in, 500 pounds of liquid, and 300 gallons of water, and steam is turned on and kept on for some hours, the potash is all dissolved, is it not, is the liquid? A.—All but some impurities, which we often find in the crude potash.

Q.—Is it that would be so small it would be insignificent? A.—O, I don't know. I got a great deal of sediment from the potash I used.

Q.—The potash is only stronger as it is in solution, isn't it? A.—That is, only a part.

Q.—The stuff that was in the bottom, the dirt and outside matter, would not in any way effect the strength of the solution of the crude potash, would it? A.—No.

Q.—And the crude potash in solution would go over the top of the vat just the same as it would go out through the bung hole, wouldn't it? A.—Yes, sir.

Q.—In other words it is suspended in the liquid in the vat? A.—Yes.

Water in the Human Body.

Q.—Isn't it a fact that from 65 to 70 per cent of the human body is water? A.—In an elementary class we say about two-thirds, yes.

Q.—So that if a human body weighing from 100 to 115 pounds was boiled in a wooden vat, in a solution of crude potash, two-thirds of this human body would turn into water, would it not? A.—Yes, sir.

Q.—And about one-third of this body would be left in the way of bones, if any were left, or the remains, or what was not dissolved and disintegrated and destroyed by the crude potash? A.—Yes, sir.

Q.—We will assume we have such a vat, in which we have placed 378 pounds of crude potash, and dissolved it, making about 500 gallons of solution, and that in this vat and in this solution we have boiled a human body, by means of a steam pipe, you would have the organic and the inorganic matter both in the solution, in the liquid, would you not? A.—No, not both in solution.

Q.—In solution or suspension, one or the other? A.—O!

Q.—And if you put a hose in this vat, and it was washed over the top, they would both wash out in about the same proportion, would they not? A.—That I am not prepared to answer. It depends on the strength of the stream of water, its velocity, the size of the pipe, and how deep the hose goes into the vat. That would make quite a difference in the results.

Q.—If in this vat, 3 feet wide, 3 feet deep, and 11 feet 2 inches long, in which 378 pounds of the crude potash was placed, making a solution of about 500 gallons, a human body was placed and boiled, so that they were both in solution, or in suspension in this solution, and then a hose was put in this vat and it was allowed to run, so that by chemical analysis it was definitely determined that one-half of 1 per cent of inorganic matter was left, or about thirty-one pounds for the vat, the human body so placed in that vat must have weighed about 700 pounds, mustn't it? A.—No, sir.

Q.—Assuming that a human body weighing 110 or 115 pounds is boiled in a vat 3 feet wide, 3 feet deep, 11 feet 2 inches long, after there has been placed in this vat 378 pounds of crude potash, in this solution, amounting to about 500 gallons, and that this vat has a steam pipe leading into it about three-quarters of an inch in diameter on the inside, and that a human body is boiled in this vat for two and a half or three hours, I will ask you whether or not a slimy, soapy residue would be produced or left in the vat? A.—Let me ask you one question, please. Without running extra water?

Q.—I am going to ask you about the running water afterwards. A.—All right. What is left in the vat is greasy and reddish liquid, which, by cooling, may turn into a kind of a jelly, and at the bottom of the vat would be more or less disintegrated bones, I believe. A part of the flesh may not be dissolved. There may be shreds of flesh or dress not dissolved.

Q.—Was there 378 pounds of alkali in a 500-gallon solution wholly destroy all of the grease and fat of a human body weighing 110 or 115 pounds A.—No.

How Much Residue Left.

Q.—Assume, then, that in this vat a hose is placed, and the water is allowed to run some eight or ten hours, and that effected that all of this residue, that is left in the vat, is washed out on to the floor, over the top of the vat, how much residue would be left of this human body in the vat and on the floor? A.—I don't know.

Q.—Would not the solid residue under any circumstances exceed more than one-third of the weight of the human body placed in the vat, could it? A.—No.

Q.—Mr. McEwen questioned you yesterday about a vat, and an assumed liquid in this vat, where 378 pounds of crude potash was put in a vat 3 feet wide, 3 feet deep, and 11 feet 2 inches long, so that there was about one foot of liquid in this vat. I will ask you if you can tell me what the approximate strength of that solution would be? A.—I don't know. I did not calculate it.

Q.—Would it be about 20 per cent? A.—I don't know.

Q.—What is the percentage of strength of a crude potash solution made by dissolving 378 pounds of crude potash in such a tank, with enough water to make the depth of the solution two feet, assuming that the tank was tank two-thirds full? A.—I have not calculated that.

Q.—Isn't there a vast difference between the effect upon flesh and bones, of an 8 or 10 per cent solution of caustic potash and a 40 per cent? A.—There is a difference in the effect, yes.

Q.—The 20 per cent solution would be very much more virulent than the 8 or 10 per cent, would it not? A.—I am not prepared to give a definite answer on that question. My experience tends to show, although it is quite limited, that a very strong solution seems to act less completely than a moderate strong one.

Q.—Can you differentiate by chemical analysis between the bones of a human being and the bones of any other warm-blooded animal that eats about the same kinds of food we do? A.—No.

Q.—Can you differentiate by chemical analysis between the teeth of a human being and the teeth of any other warm-blooded animal that eats about the same kind of food that we do? A.—I don't know that there is essentially a chemical difference.

Q.—Can you differentiate by chemical analysis between flesh of a human being and the flesh of any other warm-blooded animal that eats about the same kind of food that we do? A.—No.

Would Have to Be Diluted.

Q.—If we assume a solution of crude potash of say 5 per cent strength, it would have to be diluted ten times, would it not, in order to get one-tenth of a solution of one-half of 1 per cent of crude potash? A.—Yes, sir.

Q.—And if we assume a solution of 10 per cent of crude potash, it would have to be diluted twenty times, would it not, in order to get one-half of 1 per cent? A.—Yes, sir.

Q.—Can you tell what sort of liquid would result from the cooking of a human body by steam heat in such a vat as I have described? A.—Without any chemicals?

Q.—No, sir. I mean with the solution of crude potash, and open vat. A.—No.

Q.—Have you made any experiments cooking a human body in an open vat? A.—No, sir.

Q.—If it is true that about one-fifth of the human body is organic matter, a body weighing 110 pounds would contain about twenty-two pounds of organic matter, would it not? A.—I suppose so.

Q.—Do you know how much aluminium is ordinarily used in a set of upper false teeth, where the plate is made of aluminium? A.—No.

Q.—Was that fresh in a sufficient state of preservation for you to identify from what animal it came? A.—No. I didn't try.

Q.—Would there be any difference, in your opinion, in the temperature obtained when the top of the vat was covered with doors and gunny sacks and when it was not? A.—I don't think it would make a great difference. Perhaps a few degrees. I don't think it would be material.

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Q.—In solution or suspension, one or the other? A.—O!

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Q.—Assume, then, that in this vat a hose is placed, and the water is allowed to run some eight or ten hours, and that effected that all of this residue, that is left in the vat, is washed out on to the floor, over the top of the vat, how much residue would be left of this human body in the vat and on the floor? A.—I don't know.

Q.—Would not the solid residue under any circumstances exceed more than one-third of the weight of the human body placed in the vat, could it? A.—No.

Q.—Mr. McEwen questioned you yesterday about a vat, and an assumed liquid in this vat, where 378 pounds of crude potash was put in a vat 3 feet wide, 3 feet deep, and 11 feet 2 inches long, so that there was about one foot of liquid in this vat. I will ask you if you can tell me what the approximate strength of that solution would be? A.—I don't know. I did not calculate it.

Q.—Would it be about 20 per cent? A.—I don't know.

Q.—What is the percentage of strength of a crude potash solution made by dissolving 378 pounds of crude potash in such a tank, with enough water to make the depth of the solution two feet, assuming that the tank was tank two-thirds full? A.—I have not calculated that.

Q.—Isn't there a vast difference between the effect upon flesh and bones, of an 8 or 10 per cent solution of caustic potash and a 40 per cent? A.—There is a difference in the effect, yes.

Q.—The 20 per cent solution would be very much more virulent than the 8 or 10 per cent, would it not? A.—I am not prepared to give a definite answer on that question. My experience tends to show, although it is quite limited, that a very strong solution seems to act less completely than a moderate strong one.

Q.—Can you differentiate by chemical analysis between the bones of a human being and the bones of any other warm-blooded animal that eats about the same kinds of food we do? A.—No.

Q.—Can you differentiate by chemical analysis between the teeth of a human being and the teeth of any other warm-blooded animal that eats about the same kind of food that we do? A.—I don't know that there is essentially a chemical difference.

Q.—Can you differentiate by chemical analysis between flesh of a human being and the flesh of any other warm-blooded animal that eats about the same kind of food that we do? A.—No.

Would Have to Be Diluted.

Q.—If we assume a solution of crude potash of say 5 per cent strength, it would have to be diluted ten times, would it not, in order to get one-tenth of a solution of one-half of 1 per cent of crude potash? A.—Yes, sir.

Q.—And if we assume a solution of 10 per cent of crude potash, it would have to be diluted twenty times, would it not, in order to get one-half of 1 per cent? A.—Yes, sir.

Q.—Can you tell what sort of liquid would result from the cooking of a human body by steam heat in such a vat as I have described? A.—Without any chemicals?

Q.—No, I mean with the solution of crude potash, and open vat. A.—No.

Q.—Have you made any experiments cooking a human body in an open vat? A.—No, sir.

Q.—If it is true that about one-fifth of the human body is organic matter, a body weighing 110 pounds would contain about twenty-two pounds of organic matter, would it not? A.—I suppose so.

Q.—Do you know how much aluminium is ordinarily used in a set of upper false teeth, where the plate is made of aluminium? A.—No.

Q.—Was that fresh in a sufficient state of preservation for you to identify from what animal it came? A.—No. I didn't try.

Q.—Would there be any difference, in your opinion, in the temperature obtained when the top of the vat was covered with doors and gunny sacks and when it was not? A.—I don't think it would make a great difference. Perhaps a few degrees. I don't think it would be material.

Test of Boiling a Human Body.

Q.—If a human body were boiled in such a vat as I have that described, with the top covered, would not the condensation of steam continually increase the amount of liquid in the vat, and thus dilute the strength of the liquid? A.—If the covering is perfectly tight it will.

Q.—Would doors and sacks put on the top of such a vat be tight enough to keep the condensing steam? A.—No.

Q.—The steam would escape under such circumstances? A.—Some of it, at least.

Q.—If there was one-half of 1 per cent of mineral matter, inorganic matter, in that vat, that would weigh about thirty-one pounds, wouldn't it, a little over? A.—I think so.

Q.—Can you tell how much water must have gone into this vat, assuming it was put in through a hose in the vat, and run over the top, and down to the sewer, to dilute these 378 pounds of crude potash down to thirty-one pounds of crude potash? A.—I don't know.

Q.—This stuff is all in solution is it not, and it would run over the top, just as well as it would through the bottom, wouldn't it? A.—I don't think it is all in the solution.

Q.—Where 378 pounds of crude potash is put in, 500 pounds of liquid, and 300 gallons of water, and steam is turned on and kept on for some hours, the potash is all dissolved, is it not, is the liquid? A.—All but some impurities, which we often find in the crude potash.

Q.—Is it that would be so small it would be insignificent? A.—O, I don't know. I got a great deal of sediment from the potash I used.

Q.—The potash is only stronger as it is in solution, isn't it? A.—That is, only a part.

Q.—The stuff that was in the bottom, the dirt and outside matter, would not in any way effect the strength of the solution of the crude potash, would it? A.—No.

Q.—And the crude potash in solution would go over the top of the vat just the same as it would go out through the bung hole, wouldn't it? A.—Yes, sir.

Q.—In other words it is suspended in the liquid in the vat? A.—Yes.

Water in the Human Body.

Q.—Isn't it a fact that from 65 to 70 per cent of the human body is water? A.—In an elementary class we say about two-thirds, yes.

Q.—So that if a human body weighing from 100 to 115 pounds was boiled in a wooden vat, in a solution of crude potash, two-thirds of this human body would turn into water, would it not? A.—Yes, sir.

Q.—And about one-third of this body would be

8 inches wide, and 3 feet high, to contain a solution of crude potash, to a depth of one foot, such solution being made up of water and 378 pounds of the ordinary commercial article of crude potash; suppose a single steam pipe, seven-eighths of an inch in diameter, extending into the tank; suppose the solution in the vat be heated by means of steam from a boiler carrying from sixty to seventy pounds of steam and heated to the boiling point; suppose a human body weighing from 100 to 110 pounds be placed in such solution in such vat, and the vat covered by wooden doors, what in your opinion would be the effect upon such human body and the effect of boiling the same in such solution for a period of two hours and a half?

A.—A human body of the size mentioned, under those circumstances, would be to a considerable extent destroyed. The hair, skin, most of the muscles, and most of the internal organs would be entirely dissolved. Very likely a portion of the soft tissues would remain in a solid state, but the quanity that would be left would not be very large. The fat would be partially converted into soap, but the majority portion of it would simply be set at liberty and would float on the top of the liquid. There would be left, therefore, the bones, which would also be affected to a greater or less extent, depending upon a variety of circumstances. The major portion of the bones would be so softened as to crumble very rapidly upon pressure or upon being stirred about—crumble into either dust or small pieces. Some bones would not be affected nearly as much as others. Bones, for instance the bones of the thigh, legs, and arms, would be affected, but not as greatly as those of the other ends would be softened and would have a tendency to become soft. The central parts would be harder and would maintain their structure unless quite violently struck. The jaw-bone is affected like all the bones, but it is not affected as much as most of the other bones. It remains intact. An interesting fact is that the smaller bones of the hands and feet would be affected to the extent that we might suppose. They, passing through the solution—some of them, at least—while softened, still maintain their shape quite perfectly. Those in the main are the effects of the solution upon the human body.

Effect Upon the Skull.

Q.—Directing your attention to the skull, will you describe the effects of such solution upon the human skull? A.—The bones of the skull are distinguished by softened, as they are in any other part of the body. The bones generally do not lose their complete identity as thoroughly as some of the other bones, as, for instance, some of the vertebrae, and yet they are acted upon, but not as remarkably as some of the other bones.

Q.—Directing your attention to the human teeth, what would be the effect upon the teeth, and the teeth in connection with the jaw? A.—The teeth are not very much acted on. They are somewhat so, because they are much less acted on than true bones. They become somewhat loose in their position in the jawbone, but they do not drop out with any very great degree of ease.

Q.—What is the difference, if you know, between the effect of such a solution under such conditions upon the enamel of the tooth and the other portion of the tooth? A.—The effect upon the enamel is much less than upon the other part of the teeth. The enamel resists the action of the potash better than the other parts of the tooth do.

Q.—If a tooth were in process of decay would that make any difference in the effect of such a solution upon the human tooth under such conditions? A.—During the process of decay the tooth is likely to be broken off or removed, and the potash has a better chance to get at the inside of the tooth, and therefore would be more effective of destroying the tooth. Decayed teeth, I found, are much more effected by the boiling potash than some teeth, but still I find that teeth are not affected as much as most other bones.

Q.—Do you know the effect of such a solution upon the various metals, and the various vegetable and animal fibers, such as cloth and materials that are ordinarily found upon a human being in the way of dress? A.—I know the effect of such a solution upon several of the metals, and upon most kinds of cloth.

Q.—Will you describe the effect of such a solution, such conditions, upon the metal gold, if you know? A.—It would have no effect upon gold.

Q.—Describe the effect upon silver, in solution, under such conditions upon aluminum? A.—Aluminum would be very rapidly dissolved, and pass completely into the solution.

Q.—What is the effect, if you know, of such solution, under such conditions, upon rubber? A.—It does not affect rubber, except, perhaps, to a small degree. It does not affect it very greatly.

Effect Upon Cloth.

Q.—Will you describe its effect, if you can, under such conditions, upon the several cloths, such as linen, cotton, and woolen? A.—Woolen cloth is dissolved by it just as hair is. Cotton and linen cloth are not affected, except to a very slight extent. Silk would be dissolved like wool.

Q.—What is the effect of such a solution, under such conditions, upon the wood? A.—It has but little effect upon the wood. Q.—What, if you know, is the effect of such a solution, under such conditions, upon leather, such as the leather of a slipper or shoe? A.—It dissolves the leather, but less quickly than unsoaked skin.

Q.—Will you describe its effect upon iron? A.—It would have little or no effect upon iron.

Q.—Do you know how susceptible bones which have passed through such a solution as I have described, under such conditions, are to the action of fire? A.—I do.

Q.—Will you describe what the effect of fire applied to bones in such condition is? A.—Bones that have been acted on by crude potash are, as a rule, more easily consumed, more easily burned and destroyed than those that have not been acted upon by the potash. Occasionally, however, under some conditions which I do not fully understand, a bone that has been acted upon by the potash seems to be more preserved. It will be placed in the fire. The animal matter which has still life in it burns it, but the potash seems in some way to fuse and protect the bone, and preserves its original form better than would be the case if the potash had not been used. But in the main, bones that have been treated with crude potash are consumed more easily than those that have not been treated.

Q.—Is there any exception to be made in any of the bones, such as teeth, as to the destruction by fire or the possibility of destruction by fire? A.—No. Teeth that have been acted on by crude potash are destroyed in a fire with great ease.

The witness' attention was called to the several bones contained in the boxes described as Exhibits 10, 11, 12, and 13, and said the bones in bbxes labeled No. 11, 12, and 13 he recently had in his possession, but not the bones in box labeled No. 10.

Scrapings from the Knife.

The witness was shown the Luetgert pocketknife and said he first saw it on Monday of this week and continued:

I have examined some scrapings from the knife. The scrapings were taken chiefly from this little groove that is used to open the knife. A few were taken from the inside.

Q.—Did you make any analysis or tests of such scrapings? A.—I examined them under the microscope.

Q.—What was the result of the examination? A.—I found muscular fiber, or in other words, minute particles of flesh. I also found a little blood.

Q.—Are you able to state any further regarding the character of this musculer tissue and blood as to distinguishing it from mammal blood from any other kind of blood? A.—That the blood was that of some animal that is of some higher animals, but I cannot state anything further about it.

The witness testified to the approximate proportion of caustic potash and caustic soda in the ordinary crude potash.

Q.—Suppose a wooden vat, 11 feet long, 2 feet

cle of crude potash; also its effect under certain conditions.

Witness Is Cross-Examined.

The professor was cross-examined by Mr. Vincent, showing the witness' experience in conducting experiments with flesh in a solution of crude potash. He said he had made an experiment with a human body in a metallic vessel with a flame underneath.

Q.—I understand you to say that if a human body was boiled in a wooden vat by means of steam—a body weighing 100 to 110 pounds—for two hours and a half, with this supposed vat covered with wooden doors and gunny bags such as we have here in court, that there would be very little of the body left except the bones. Did I understand you correctly? A.—I said there would be some left. I said I think the major