Examination - November 8, 1926

Name - [redacted] Age 28 - white - married. Two children, aged five and three. Employed by the Atlantic Refining Company, as filling station attendant.

Previous history of illnesses included a dropsical condition lasting two months as a child; pneumonia following tonsilectomy several years ago; the loss of sight of one eye, as a result of an auto accident a few years ago. G. O. in 1917. History otherwise negative. No family history of importance.

He first worked two years in steel mills, making sheet stell, "roughing". He was in the army 16 months up to the end of the war, in the ordinance department. This was followed by vocational training for 1-1/2 years as draftsman. Afterward he was engaged in repairing, wiring and installing radio equipment. For five months previous to his present illness he was a filling station attendant, as above, beginning May 26, 1926. The Atlantic Refining Company began to distribute Ethyl Gasoline in July 1926. There is no evidence of previous lead exposure.

PRESENT ILLNESS -

Prior to handling Ethyl Gasoline had no symptoms. In September, about the 20th, began to note a diarrhoea and general weakness. A week later developed tingling sensation in fingers, and could scarcely hold a pencil. Could grip but could not extend fingers. The condition became worse, and he came to Cannonsburg Hospital on October 15, 1926. Was seen by Dr. Wright of Pittsburgh just before entrance into hospital.

His bongue became sore, his gums were swollen, and he had abdominal cramps which were never localized in any one place. The cramps were inconstant and were usually on one side or the other, not in the mid abdominal region above the umbilicus. Weakness and tingling in the legs developed later. The weakness increased until the subject was put to bed and then sent to the hospital on the above date. At first he was restless and slept fitfully. He suffered pain in knees, ankles and wrists.

(All of the above information was given by the patient, who as a result of the examinations and discussions of his physicians was well aware of the symptoms and signs of lead poisoining. There is little reason to doubt his honesty, but there is some evidence that he has emphasized certain symptoms and has neglected others, in a statement of the course of his illness. Exact details are difficult to obtain because of a lack of record prior to his entrance into the hospital.)

The hospital record contributes little to the above story except a temperature chart, which shows that on admission to the hospital his temperature was 98.8, going up to 101 that night. He continued to run an irregular temperature up to October 20, since which time it has been normal or subnormal, and somewhat irregular. This according to his physician, Dr. J. A. Johnson - was due to a cold contracted in the hospital, though the patient says he had fever prior to being in hospital.

A further observation noted on the hospital chart is a urinalysis - showing albuminuria, with casts. No stippling has been found at any time.

Subject: [redacted] (continued)

Present Complaints -

Some constipation. Takes cathartics daily.
Weakness. Pains in joints - knees, wrists and ankles.
Headache for past three days.
Tingling sensations in feet. A feeling of "vibrations" up and down spine.

PHYSICAL EXAMINATION

The subject is a young man, of fairly good color, slender in build and apparently somewhat emaciated, though not strikingly so, lying in bed languidly but apparently comfortably.

There is a scar completely obstructing vision in the right eye. The left reacts to light and accommodation normally.

The mucosa of the nose is red and encrusted, and swollen.

The burbinates, especially the inferior, are hypertrophied.

The tongue is coated and fissured; the throat is red and edematous. There is a post nasal purulent exudate.

The cervical lymph glands on the right side posteriorally are palpable and tender

There is a general suppurative gingivitis, and there is a carious left lower first molar tooth. No suggestion of a lead line is present.

The first heart sound is a little weak, but there are no abnormal sounds.

The left apex shows a slightly reduced resonance, and there is an increased transmission of the whippered voice. The breath sounds are rough, but there is no moisture present in the lung parehchyma

No abnormalities are found in the abdomen.

The reflexes are normal. Sensation was not studied with detailed care, but a definite area of hyperasthesia was found over the back beginning on both sides just below the angle of the scapula and extending down to the upper liver border.

There is no evident loss of ordinary tactile or thermal or pain sensibility.

There is no evidence of paralysis of any of the muscles. The hand shows no evidence of present weakness of a noticeable type, and there is no wasting of the muscles.

Subject: [redacted] (continued)

The urine is acid in reaction, contains albumin, and a few casts are seen microscopically.

A red count shows five million erythrocytes.

One faintly stippled erythrocyte was found in 100 fields

Differential count showed - Poly-Neutrophiles 61
Eosinophiles 4
Basophiles 1
Mononuclear 4
Lymphocytes 30

No abnormal cells found

Analysis of faeces and urine for lead showed the following:

Faeces - Dry weight 18.15 gm - Pb found 0.25
Pb found per gm. ash - 0.09 mgs

Urine - Volume 3720 cc - Pb found 0.41
Pb found per liter - 0.11 mg.

In view of the above physical findings I recommended X-Ray examinations of teeth and chest, and a blood Wasserman.

The Lungs and spine showed no abnormalities

The carious tooth showed an apical abscess

The blood Wasserman was negative

I attempted to get details of the onset and course of the condition pri to my examination from Dr. Johnson and Dr. Wright, but obtained no more than is indicated herein. Dr. Wright stated that he was by no means su that the patient had lead poisoning.

Inspection of the service station in order to get an idea of possible exposure, showed that the method of dispensing Ethyl gasoline (Pressure system with valve on end of hose line) sometimes allowed skin contact with the gasoline. When a valve leaks the hose line becomes we and the operator can scarcely avoid contact with it. About one fifth o the total sales from this man's station were Ethyl Gasoline and only on of the Ethyl hose lines showed a leak. The actual period of skin contact with Ethyl Gasoline was not great, therefore, though such contact present, The spillage of gasoline at these stations is rare.

Mr. [redacted]

April 8, 1931

ETHYL GASOLINE CORPORATION

Copy sent to Dr. Leake - 4-19-32

NOTES ON CASE

Case No.................... Name....................

A Mr [redacted] came in on Apr 3 having been referred by Dr Roedenburg. The pt had spilled some Ethyl gasoline on his foot 2 yrs ago - had failed to remove his shoe and subsequently had developed an infected foot. The foot was apparently badly infected but remained superficial + localized. Mr [redacted] states that about the same time of the foot infection he developed skin lesions on his face which have persisted until the present. Dr Roedenburg felt there might be some connection between the two lesions and sent the pt to us. No general physical was done as it was considered unnecessary. There is no significant exposure to lead compounds of any kind and the skin condition is an eczema. The pt states that this clears in the summer months. After an explanation of the degree of his exposure the pt seems to be satisfied that he is not suffering from the effects of tetra ethyl lead. Dr Roedenburg was also called and an explanation made to him.

Sanders

[redacted] is a mechanic and dispenser of gasoline.

[redacted]

Atlantic Refining Company
Pittsburg, Pa.

November 12,1926.

Dr. George J. Wright,
121 University Place.
Pittsburgh, Pa.

My dear Doctor Wright:

Some days ago I was notified of the development of a case of possible lead poisoning in a man in Pittsburgh, [redacted], an employee of the Atlantic Refining Company, he being a server at a filling station for this company. As a consultant of the Ethyl Gasoline Corporation of New York, and in cooperation with the United States Public Health Service, I, and several assistants, have been keeping a continual check on the possible hazards arising from the manufacture and distribution of Ethyl fluid, as well as the men who are handling Ethyl gasoline which contains a very small quantity of this fluid.

In as much as this is the first reported case of anything which bears any resemblence whatsoever to lead poisoning in men who have had to do with the handling of gasoline, several hundred men having handled it continuously over a period of over three and one-half to four years, an unusual interest and importance attaches itself to this case. I, therefore, went to Pittsburgh as soon as the matter was reported to me, and made an examination of this man at Connonsburg, Pennsylvania.

Doctor Sands of Pittsburgh reported to me that you had made an examination of this man some time ago, and I am, therefore, very anxious to determine what were your observations and findings and conclusions at that time. In as much as this man at present shows little or no indication of injury of the type which might be attributable to lead, and especially in as much as his only exposure to lead, which according to his history, relates to a period of approximately two and one-half months during which time he was handling Ethyl Gasoline, and in as much as this exposure to lead in terms of the experiences of several hundred other men, and in terms of information arrived at experimentally on animals, it is entirely insignificant even granting a remarkable susceptibility. It seems likely that some other diagnosis must be arrived at. I am making an attempt to gather together all of the facts and findings and to make such further examinations as are indicated in order to arrive at a certain diagnosis if possi-

ble, and I feel that the observations made on him as well as those which must be made from now on are of the utmost importance in arriving at a conclusion. I should appreciate it very greatly if you would inform me as to your findings, and if you will give me a frank statement of your own concerning the nature of this man's illness.

Very truly yours,

RAK:OJ

November 10,1926.

Mr. E. W. Webb,
c/o The Ethyl Gasoline Corp.,
25 Broadway,
New York, N.Y.

My dear Mr. Webb:

Following your suggestion by telephone from New York, I went to Pittsburgh on Monday of this week. I first had an interview with Doctor Sands who made it possible for me to see the physician who was originally in charge of the man whom I wished to see. I found he was in a hospital in Cannonsburg, Pennsylvania to which point I went directly and made as careful an examination as was possible considering the somewhat meager facilities of the hospital. As you know this man had been seen previously by Doctor Wright of Pittsburgh, who is a rather well known man in his line of work which is essentially neuro-psychiatry. The diagnosis of all three of the men who had seen [redacted] had been agreed upon as lead poisoning. I have not seen Doctor Wright's report and was unable to get in connection with him as he was out of the city, so that I do not know how positive he was in his conclusions. I shall correspond with him at the earliest convenience and determine just what his opinion is and upon what basis it was arrived at.

My own examination disclosed the fact that this man has certain signs and symptoms which suggest lead poisoning of a chronic type. The history in brief is as follows. During a period of about two and one-half months in which he was handling Ethyl gasoline in a fashion customary for filling station employees, this man had what is apparently his only exposure at any time to lead. I went carefully into the matter of previous exposures and found no evidence whatsoever of any such exposure. His work at the filling station had to do with the occasional filling of tank wagons, which involved no unusual spillage or exposure, and the routine filling of automobile tanks of which approximately one out of three were filled with Ethyl gasoline. The man himself states that he very frequently had his hands bathed in Ethyl fluid as a result of the leakage of sutffing boxes and hoses which carried the Ethyl gasoline from the meter into the automobile tank. A careful check up at filling stations throughout the city, which I made later in the day, showed that it is only rarely that one of these filling devices leaks badly and that it is, therefore, not likely that there was any continuous and considerable soaking of the hands in Ethyl gasoline. So much for the history of exposure.

Having begun to handle Ethyl fluid in July, this man noticed in September a tingling sensation in his fingers and some loss of sensation and inability to use his fingers, so that it was very difficult for him to hold a pencil and very difficult to unclasp his hand after it was once clasped. Along with this he developed certain tingling sensations with aching in certain parts of the body, notably the legs, and

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E. H. Webb.

eral weakness with some restlessness at night, without, aving a real insomnia and without any disturbing or frightof any kind. This condition gradually increased. The thing arising being a rather severe diarrhoea for a few days in the very early stages. Shortly after this he was seen byall of the physicians who have reported on him, all of whom arrived at a diagnosis of lead poisoning, presumably, largely on the basis of the history of lead exposure in connection with the handling of Ethyl gasoline.

The physical examination shows the man at present to be a fairly healthy looking young man with weakness undoubtedly and apparently some loss of weight, although he is not severely emaciated. He has at present some evidence of an acute respiratory infection and has been running an intermittent fever since admission into the hospital, and according to his story since some days previous to his admission to the hospital which was October the fifteenth. He has at present no paralysis at all and not apparent muscular weakness. That is to say whatever symptoms of wrist drop which he once had have now disappeared (it is worth while to take notice of the fact that this disappearance occurred in the very short space of a few weeks). He complains somewhat of "vibrations" by which as near as I can make out he means tingling sensations through his lower extremities and particularly through his back, and there are areas of extreme hyper-sensitivity in certain areas on his back. There is no lead line on the gums and there is no stippling in his blood at all, and according to the report of Dbctor Johnson there has not been any stippling at any time. There is some suggestion of involvement of his chest over the left side. I think, however, that this is due to his upper respiratory infection and has no significance as to the nervous lesions. At the time of his entrance to the hospital he showed signs of a kidney condition which may have been a general intoxication, but it more likely represented a localized infectious process in the kidney. Unfortunately I was unable to obtain a specimen of urine for examination. I did, however, obtain specimens of blood for count and for examination for stippling.

My conclusions concerning this man are that although there are certain things characteristic, or rather I should say suggestive of lead poisoning in the muscular weakness and partial paralysis which he developed, that it is much more likely that he has some other condition. My conclusion is based on the following things. First of all, I regard his exposure to lead in handling Ethyl gasoline as being insignificant. It is, therefore, incumbant upon the physician to prove the diagnosis of lead poisoning rather than to disprove it. The question, of course, will arise at once as to whether this man does not have a very striking and undue susceptibility to lead. This can be answered in general by saying that it is very strange that several hundred other men who have had much more exposure do not present us with a single case of any signs or symptoms of lead poisoning.

Secondly, there are certain things in the clinical picture of this case which are not at all typical of lead poisoning in spite of reports to the contrary. He did not have a lead line and in my opinion has never

had a lead line in all probability, because the history of these cases uniformly shows that a lead line, if existing at all, persists over a period of months rather than a few short weeks. He did not have stippling in his blood and according to the report of one of his physicians has never had. Then again it is not characteristic of lead neuroses to disappear so rapidly, they ordinarily persist for many months and show increase in severity for some time rather than a decrease. Then again the initial diarrhoea and the apparent intermittent fever are also a stumbling block in the diagnosis of lead poisoning. For these reasons I feel that it is necessary to proceed with all possible means to making a positive diagnosis. There are at least three possibilities other than lead poisoning in the case of this man. The best of these, I think, is that of an infectious poly-neuritis, the cause of which might easily have arisen in several badly infected teeth. This possibility is supported to some extent by his having an elevation of temperature over apparently the greater part of his illness. Another possibility is that of hysteria which I am inclined to think is not very likely since this man shows no temperamental condition suggestive of that state. Another possibility and a fairly good one is that of a syphilitic infection of the spinal cord. This has been discouraged to some extent because of a negative blood examination, but can only be checked up by examination of his spinal fluid. One other possibility which is a remote one I think but which must never the less be taken into consideration is that of spinal cord lesion, which in this case would most probably be syringo-myelia. It is necessary in arriving at a diagnosis to make a careful check and systematically rule out each one of these things before arriving at a diagnosis of lead poisoning, for there is no question from our experience that lead poisoning is the less likely diagnosis of any of those mentioned.

Now the above things, however, apparently have not been taken into consideration in the case of this man, largely because of what appeared to be in the minds of the doctors who saw him the significant history of lead exposure,(may I degress a moment at this point and point out to you that that is just exactly the condition which I fear may repeat itself frequently if we have a considerable portion of men of various kinds of ability in positions of partial responsibility in looking after men who are handling Ethyl fluid and Ethyl gasoline.

The question now is as to how we shall proceed to make a positive diagnosis on this man. I have begun this by requesting that several examinations be made. I have asked for an xray examination of the chest and of the spinal column and for a considerable quantity of urine and feces to be mailed into our laboratory for analysis. It is difficult for me to get more information than this.

Three possibilities present themselves. The first of these is to report this matter immediately to Doctor Leake asking him to obtain a neurologist whom we both agree to be perfectly satisfactory in making a diagnosis, and to go with him to Cannonsburg to see this man and to make what further examinations are necessary in order to establish a diagnosis. As a matter of fact, Doctor Wright of Pittsburgh would be a satisfactory man for this thing in my opinion. The second possibility would be to write to Doctor Wright himself pointing out the extremely insignificant exposure to lead which this man has had, and suggest tact-

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Mr. E. W. Webb.

fully the possibility of other diagnoses, suggesting to him that at our expense he go to whatever trouble is necessary in order to systematically rule out the various possibilities and to fasten upon one of these as the diagnosis. The third possibility is to get this man into a hospital either in Pittsburgh or get him to Cincinnati where it would be possible to obtain such information and to make such observations as would clinch the diagnosis one way or the other.

Now for obvious reasons I do not say that this is not lead poisoning, nor do I have any bias whatsoever in the matter, if however it is lead poisoning as it might be by stretching the imagination to the utmost, it is best that I know it and that you know it. The main thing, however, is to make a diagnosis if it can be made. If you have any suggestion to offer as to any other method of procedure, please let me know at once.

I trust that this will acquaint you completely with the situation and that you will not have any undue alarm from it.

With kindest regards.

Very truly yours,

RAK:OJ