

C. A. Wood

1904

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Blindness

## POISONING BY WOOD ALCOHOL.

CASES OF DEATH AND BLINDNESS FROM COLUMBIAN SPIRITS AND OTHER METHYLATED PREPARATIONS.\*

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AND

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With the kind assistance of the profession in the United States and Canada, we have been able to report the following instances of methyl alcohol intoxication, most of them hitherto unpublished.

The list of deaths and cases of blindness following the ingestion of "Columbian spirits" and other forms of wood alcohol, as well as methylated "Jamaica ginger," lemon "extract," "bay rum," "cologne water," "witch hazel," essence of peppermint, essence of lemon, etc.; not to mention all sorts and kinds of other official, domestic and proprietary remedies into which alcohol enters, has lately grown to alarming proportions. This record of death and blindness has been made in recent years only, since the cheap, "deodorized" methyl alcohol [untaxed, retail price 50 cents a gallon; ethyl alcohol, taxed, retail price \$2.60 a gallon] has been put on the market.

Wood alcohol and methylated spirits made by the old processes subserved useful as well as harmless purposes. They possessed practically all the solvent and other properties required for the various arts in which they were employed, and no one thought of drinking them or employing them as adulterants in foods or drugs. Indeed, so abhorrent to the organs of taste and smell was even a small percentage of wood spirit in any mixture, that no person in his senses would drink so nauseous a compound, however diluted and disguised, or however much he craved an alcoholic drink.

\*Read at the Fifty-fifth Annual Session of the American Medical Association, in the Section on Ophthalmology, and approved for publication by the Executive Committee: Drs. Frank Allport, John E. Weeks and R. L. Randolph.

With the advent of preparations like "Columbian spirits," "colonial spirits," "eagle spirits," *et hoc genus omne*, the principal safeguard against poisoning by methylic alcohol has been removed. Some of these deodorized alcohols are with much difficulty distinguished by the laity from pure ethyl alcohol. Hence it is that in spite of ordinary precautions, such as labeling bottles of these preparations "not to be taken internally," they have been and are now, through accident and design, much used as substitutes for grain alcohol.

The appended histories by no means constitute a complete list of deaths and blindness from wood alcohol poisoning. A more careful canvass will, we are sure, bring to light numerous additional instances of this intoxication that we have not been able to gather during the limited time at our disposal. The remarks of Dr Moulton properly apply to many localities where grain alcohol beverages are difficult to procure:

Cases (of wood alcohol poisoning) are of frequent occurrence in Indian Territory, where the sale of ethyl alcohol is strictly prohibited by the United States government, so that those who crave stimulants drink anything they can get. I can safely say that in that country at least fifty deaths have occurred from this cause in the last few years.

The same remarks apply, though in a less degree, to methyl alcohol blindness. A circular letter on this subject was addressed by Dr Wood to a large majority of the ophthalmic surgeons in the United States and Canada, and there is good reason to believe that, as a result of these inquiries, descriptions more or less complete of most of the well-defined and recent cases of wood alcohol amblyopia and amaurosis will be found in this report. At the same time, since blindness from methylated liquids was practically unknown until the recent introduction of this "purified" product, medical men may well be excused for not recognizing, for attributing to other causes or for afterward forgetting cases that several years ago came under their notice.

For purposes of subsequent reference we have divided these histories into four classes:

**Class A.**—Published cases of blindness or blindness followed by death, due to the drinking or inhalation of methyl alcohol. The cases comprised in Class A were collected, abstracted and tabulated by Dr. Buller.

**Class B.**—Cases (hitherto unpublished) of blindness or blindness followed by death from drinking methylated liquids.

**Class C.**—Cases (hitherto unpublished) of blindness from methyl alcohol absorbed through the lungs or skin, or both.

**Class D.**—Cases (hitherto unpublished) of death from methyl alcohol poisoning, without history of previous blindness.

The cases detailed under Classes B, C and D have been collected and edited by Dr. Wood. The sources of the information in the last three classes, arranged in alphabetical order, will be found at the head of each history.

#### SUMMARY OF PUBLISHED CASES.

The tabulated records (to appear later in this article) of 54 of the published cases show the ages of individuals to be from 21 to 65 years; mostly about middle life. Of 51 we note: Sex, males, 47; females, 4. Habits of life; 8 were, or had been, hard drinkers; 9 admitted occasional indulgence, 3 habitually temperate, 30 habits not stated, but no doubt most of them were more or less addicted to alcoholism. Six are reported

to have used tobacco in excess, as well as alcohol. Occupations: Artistic painter, 1; attendant, 1; bricklayer, 1; barber, 1; carpenter, 2; china decorator, 1; convicts, 3; dressmaker, 1; farmer, 2; housewife, 2; hotel keeper, 1; miner, 1; millhand, 1; workmen, 4; mechanic, 1; soldier, 1; sailor, 3; woodsman, 1; watchmaker, 1; upholsterer, 1; not stated, 20.

As to the mode of occurrence: In most instances the trouble occurred as a result of a spree, generally together with friends or associates; in a few instances the alcohol was taken by accident. The preparations nearly all undoubtedly contained the drug, methyl alcohol, as the sole or chief toxic ingredient. In 28 cases methyl alcohol was specified; in 12 Jamaica ginger; in 4 Columbian spirits; in 2 essence of lemon or cinnamon; in 1 cologne spirits, so-called; in 1 an unknown alcoholic mixture; in 3 methyl alcohol vapor was inhaled.

As to the quantities consumed: The methyl alcohol series varied from half an ounce to 16 ounces. The Jamaica ginger from 3 ounces to 25 ounces, the larger quantities usually in divided doses over a period of several days. Columbian spirits from 6 ounces to 8 ounces and in 2 cases quantity unknown. Essence of lemon, 5 or 6 ounces in one case, in the other quantity unknown. Cologne spirits less than 8 ounces. Of the unknown strong alcoholic liquor, 15 ounces. Of the three inhalation cases quantity inhaled conjectural.

As to general effect: Headache was mentioned in 19 cases as a conspicuous symptom; gastric pain, in 11; nausea and vomiting in 26; dilated pupils in 20.

The results as to visual disturbance were 16 total blindness; 3 total blindness of one eye; 15 partial recoveries; 7 recoveries; 10 remaining cases terminated fatally; sight became dim in three hours in one case; six hours in 1 case; eight hours in 1 case; ten hours in 1 case; twelve hours in 2 cases; twenty hours in 1 case; twenty-four hours in 19 cases; forty-eight hours in 5 cases; three days in 2 cases; six days in one case; seven days in one case; sight became lost in twenty-four hours in 10 cases; in thirty hours in 2 cases; in twelve hours in 2 cases; in forty-eight hours in 3 cases; in three days in 3 cases; in four days in 3 cases; in five days in 2 cases; in six days in 2 cases; in seven days in 1 case; in eight days in 1 case; in seventeen days in 1 case. Of the remaining 21, facts in this connection are not definite.

Certainly few members of the medical profession, and practically no one of the general public, are as yet aware that methyl alcohol taken into the system in moderate or considerable quantity not infrequently causes death, after the manner of the cases just cited. More than this, the people are still less cognizant of the fact that a certain proportion of those who survive the poisonous effect of the drug are condemned ever afterward to the miseries of greatly impaired vision, and, indeed, not infrequently to absolute blindness. It is a remarkable circumstance that, notwithstanding the accumulated evidence of many similar recorded facts, there still exists a widespread unbelief in the toxic action of wood alcohol. Not long ago, with the object of discovering cases of methyl alcohol poisoning known to have occurred in Canada, Dr. Buller wrote to thirty or more Canadian oculists, asking each one for his experience in this direction. One sent this reply which is worthy of record: It runs as follows:

I have not met with any case of blindness from drinking wood alcohol nor heard of any; notwithstanding the fact that

I live quite near one of the largest distilleries of methyl alcohol in Canada. The prevalence of the habit of intoxication from wood alcohol must be greatly exaggerated.

The italics are Dr. Buller's. Two only sent records of cases they had seen; some fifteen replied that they had no experience.

Altogether Dr. Buller knows of only five reported and three unreported cases in Canada, and has heard of four others, without so far having been able to obtain facts regarding them. Of the five reported cases, three if not four actually occurred in the United States, giving, therefore, up to the present time only one reported and three unreported, cases which have happened in Canada. It would thus appear that wood alcohol poisoning occurs much more frequently in the United States than in Canada, since of the 54 cases of which Dr. Buller has collected details, some 47 occurred in the United States and two in Europe.

B.—CASES (HITHERTO UNPUBLISHED) OF BLINDNESS, OR OF BLINDNESS FOLLOWED BY DEATH FROM DRINKING METHYL ALCOHOL.

CASE 1.—(From Dr. James A. Bach and Dr. Joseph Schneider, Milwaukee, Wis.)

D. McK., Ashland, Wis., on Nov. 26, 1903, was taken ill with abdominal pains and diarrhea, while engaged in "scaling" lumber in the northern woods of Red Cliff, Wis. Being far from any doctor, he secured a bottle of Hinkley's bone liniment and took the same internally according to directions, a teaspoonful every hour for a few hours, then less often. This treatment he continued from November 26 to November 27 inclusive. On November 29 Mr. McK. found his sight leaving him. Within twenty-four hours he became totally blind in his left eye and partially so in the right eye. He thereon consulted a doctor in Ashland, Wis., who told him that the "liniment" had probably "done the work." The patient is now (May, 1904), a man of about 40 years old, strong and robust in appearance and apparently has no bad habits. There is nothing in his history to account for his condition but the fact that he took the quack medicine as above stated, which was followed so promptly by practical blindness. The left disc is gray-white, and the smaller papillary capillaries and vessels are absent, with the exception of the lower macular artery, which is still seen. The larger arteries and veins are reduced in size about 20 per cent. V. = no perception of light. The right disc is also whitish, with a decided diminution of capillary circulation, but not so marked as the left. V = 3/40. The visual field in the right eye shows a large, absolute scotoma, not quite central, with concentric limitation marked.

CASE 2.—(From Dr. Wilfrid Beauré, Quebec, Canada. Reported by Dr. Frank Buller, Montreal.)

J. D., aged 42, machinist, was in the habit of indulging in liquor to excess every month or two. After one of these "sprees" on March 6, 1898, having no more whisky on hand, he drank about half a tumblerful of methyl alcohol from a bottle in the house. He took this one drink only and in a few hours drove to the doctor's office nearly blind. His vision in either eye was finger counting at nine inches. He had intense photophobia and pain in the head; the papillæ were white, but the retina showed no particular change. He was immediately put on potassium iodid with bromids. For a time there was considerable improvement in his vision so that he returned to work. On March 20, however, he again noticed failing sight and when Dr. Beauré saw him on March 21, V. R. = 15/40; V. L. = 15/200. The iodid was continued and he returned on the 31st, when V. R. = 15/20; V. L. = 15/40. April 18, 1898, V. R. = 15/40; V. L. = 15/100. April 25, V. R. = 15/50; V. L. = 15/100. Then citrate of iron and strychnia were prescribed. On May 9 the nerve heads were decidedly white. V. R. = 15/75, and V. L. = 15/200. The patient's eye-

1. An examination of the proprietary remedy referred to in this report was recently made for me by a competent chemist, and found to contain a large percentage of methyl alcohol.—C. A. W.

sight now became so defective that he was obliged to abandon his work and engage in selling candy in a small store. Even then he found it difficult to recognize coins or to distinguish the figures on bank bills. When Dr. Beauré last heard of him he had entirely lost useful vision.

CASE 3.—(From Dr. M. H. Bell, Vicksburg, Miss.)

M. B., man, white, aged 50; occupation, blacksmith. Now in the Mississippi State Charity Hospital under Dr. Bell's care. V., each eye, = light perception; eyes look entirely normal externally. Ophthalmoscope shows no marked changes. There is more pigment scattered over the fundi than is usually found. Nerve heads normal; vessels, both veins and arteries, are small, two-thirds usual size. Two years ago he was working in a "dry" county and, as was the habit there, used "peruna," Jamaica ginger, etc., as stimulants. The patient's usual drink was the ginger, and he told Dr. Bell that he had been taking an occasional drink of it for three or four months. While at work one day he suddenly became blind so that he had to be led home by another man. This was followed by nausea lasting two or three hours. On the same morning he had taken two or three drinks of ginger, rather indefinite as to quantity. On the following day his sight returned, but since that time gradually failed for eighteen months, after which it has remained the same. He can not now go about without some one to guide him. Although no analysis was made of these beverages, the clinical history and the other facts in the case point directly to methyl alcohol intoxication.

CASE 4.—(From Dr. George H. Bicknell, Omaha, Neb.; Dr. George B. Simpson, Sheridan, Wyo.; Dr. Casey Wood, Chicago.)

G. W. A., ranchman, Scotch, aged 35, had always had good health. An examination by Dr. W. A. Evans of Chicago proved him to be free of syphilis, rheumatism, or any disease of his internal organs. Blood, urine, etc., normal. On July 4, 1899, in company with a number of companions, he proceeded to celebrate the day by getting gloriously drunk. It is not known exactly what sort of alcohol the party imbibed, but it was considerable in amount. For the following four days he suffered from severe and constant frontal headaches, nausea, pain in the abdomen, frequent fits of vomiting and difficulty in breathing. About forty hours after the spree began he noticed a "dazzling" sensation in front of his eyes and in two or three hours more was totally blind. Dr. Wood saw him in consultation with Dr. Bicknell on July 28, 1899, when he said that on July 25 he first noticed his returning eyesight. This improvement in vision continued for a while, but there was a relapse about the time he left for his home in Scotland, the following November. On July 28, 1899, V. R. = no p. l.; V. I. = hand movements in the lower third of the field. Pupils widely dilated. Tension normal. Light reflexes absent; doubtful as to accommodation. Lenses showed a few striae. Both fundi exhibited blurred papillary outlines with loss of the usual transparent appearance of the nerve heads. Retinal veins somewhat engorged; arteries smaller than normal. This patient was vigorously treated by Dr. Simpson with potassic iodid, electricity and, later, was ordered full doses of iron and strychnia. Improvement for a time set in, with enlargement of the small eccentric field for white in the left eye. In July, 1899, he was able to see shadows and the outlines of large objects in the upper part of the right field and to count fingers at six inches with a small area in part of his upper left retina. On Nov. 13, 1899, his vision was much worse. He, at that time, perceived hand movements in the left eye eccentrically, but there was no light perception in his right eye. The fundus pictures were then greatly changed. The nerve heads showed shallow, atrophic excavations, the discs being whitish; veins of normal size, arteries small. Tension normal in both eyes. The patient was given a letter to Dr. Argyll-Robertson, Edinburgh, and has not been heard from since.

CASE 5.—(From Dr. Emil Bories, Seattle, Wash. Reported by Dr. Hamilton Stillson, Seattle, Wash.)

A German, aged 27, cabinetmaker by trade, drank about two ounces of wood alcohol that was used in a saloon for filling cigar lighters. Seen about an hour afterward, was in deep stupor, snoring, stertorous breathing; could not be aroused by his companions. Features pale, body cold, bloody froth from

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mouth, pupils dilated, no reflexes. Had him taken to city jail, where, after heroic rubbing, applying of hot packs, and hypodermic injections of strychnia, he was sufficiently aroused to answer his name. Recovery. Vision, as well as his gait, was affected for several days.

**CASE 6.**—(From Dr. A. H. Brundage and Dr. James W. Ingalls, Brooklyn, N. Y.)

Mrs. M., living at East Brooklyn, N. Y., aged about 35, was addicted to the excessive use of alcoholic drinks and occasionally drank grain alcohol with water and sugar. Having heard that wood alcohol was about the same thing but much cheaper, she purchased half a pint and drank most of it.

She was found partly unconscious and sweating profusely. She was nauseated, vomited severely and was delirious, with pupils dilated. Seemed chilly. Vision gradually became blurred. Died in about thirty-six hours from the time the wood alcohol is supposed to have been drunk.

**Treatment.**—Free siphonage of the stomach, cold effusions to head, caffeine, digitalis, pilocarpin, external heat, oxygen, rectal injections of hot coffee, and also of normal salt solution.

**CASE 7.**—(From Dr. Henry D. Bruns, New Orleans, La.)

A man, about 50 years of age, came to the clinic in 1902 with the following history: He had made toddy one evening with Columbian spirits, of which he took several drinks, using at least an ounce of the wood alcohol. Shortly afterward his vision completely failed him. He then regained much of his sight for a brief period, but finally became totally and permanently blind.\*

**CASE 8.**—(From Dr. Henry D. Bruns, New Orleans, La.)

This case,\* is that of a man of middle age who ingeniously concocted a "highball" whose spirituous portion consisted of a popular "antiseptic." He promptly became blind, but when seen a week later had somewhat improved in vision. He left the clinic and it is not possible to say whether the improvement held or not. Dr. Bruns had the proprietary article employed by this patient analyzed by the chemist of the board of health. It contained a large percentage of wood alcohol.

**CASE 9.**—(From Dr. A. E. Bulson, Jackson, Mich.; Dr. Pray, physician to the State Prison, Michigan; Dr. J. F. Byington, Battle Creek, Mich.)

John C., convict, aged 48, appeared March 5, 1903, at morning sick call and asked to be excused from work. He walked unsteadily and the pupils were somewhat dilated. He said he had eaten no breakfast and had vomited. On accusing him of having taken some drug he admitted that he had drunk wood alcohol. This was used in the prison shirt shops for dampening collars for the purpose of turning them. The mixture was equal parts of wood alcohol and water with glycerin, 2 ounces to the pint. On March 3 patient consumed 10 ounces of this mixture, and on the next day 4 ounces. He was sent to the hospital and treatment, consisting of large doses of bismuth, given to quiet the intense burning pain in the stomach. At 7 p. m., although the electric light at the head of his bed was turned on, he asked to have a light; in other words, he was apparently blind. Dr. Pray says the blindness came on quite suddenly. He instituted alternate hypodermics of pilocarpin and strychnia every four hours (1/10 gr. pilocarpin, 1/30 strychnia), and potassic iodid grs. 20. On March 10 the patient could distinguish the hand held close to his eyes. March 15 he could see quite plainly. March 18 again failing vision, and on March 24 very poor vision. Discharged from hospital March 27. Strychnia and potassic iodid continued in pharmacy. Vision 7/30. Dr. Bulson examined this case later and found only light perception in the right eye with blue white discs and marked retinal changes, the former more pronounced on the temporal side. In the left eye V. = 3/20 for central vision; about the same changes in the papilla. There was a decided contraction of the peripheral field. In September, 1903, Dr. Byington again examined this man who, then a blind pedler, presented himself with the request that the physician, as a matter of charity, give him a "statement of his case" so that he could the better dispose of his small stock in trade. Dr.

**CASES 12 and 13.**—(From Dr. Homer Collins, Duluth, Minn.)

In the year 1900 (exact date unobtainable), an Indian from one of the Minnesota reservations, accompanied by an Indian attorney (G. H. B.), consulted Dr. Collins. The history of the case showed that at least six Indians, having procured a supply of essence of lemon, drank freely of it. Three died promptly, evidently from the direct effects of the beverage, one of them becoming blind before death. Two others suffered considerably, but recovered without apparent damage to any of their organs. The sixth Indian, the patient under discussion, survived, but became totally blind. An ophthalmoscopic examination revealed marked atrophy of both optic nerves.

3. Through the kindness of Dr. J. W. Chamberlin of St. Paul, Mr. G. H. B. wrote me the following note, giving further information regarding this matter: "Your letter of inquiry reached me at White Earth, Minn. In reply, an Indian trader, named Malone (afterward prosecuted by the U. S.), sold to several Mille Lac Chippewa Indians a number of bottles of essence of lemon on June 28, 1907, which they drank in lieu of alcohol, when that had been exhausted. A large number of Indians drank alcohol; only six or eight drank the essence of lemon. The latter were all taken seriously ill within an hour after they began to drink the essence, and three of them died before morning. I can recall the name of only one of those who died, a chief, Mah-ke-wis. Another Indian, Bud-dub-ay-kehshig, became blind and has not since recovered his sight. He is still living at Mille Lac, Minn. The others, although very sick, recovered without any bad effects. It was thought at the time that the death of the Indians was due to the wood alcohol in the essence of lemon." C. A. W.

\* This case, as well as the next one, is entered in the tables published by Dr. Bruns in the annual report for 1902 of the New Orleans Eye, Ear, Nose and Throat Hospital.

Byington made only the superficial examination demanded by the patient and found V. = finger counting at 3 to 4 inches in each eye, associated with white atrophy of both nerve heads—each lamina cribrosa being distinctly visible at the bottom of a shallow, atrophic excavation.

**CASE 10.**—(From Dr. Homer Collins, Duluth, Minn.)

J. A., aged 46, carpenter, Cromwell, Minn., was in the habit of going on several spree yearly, but avoided liquor between these sprees. Used tobacco, smoking or chewing about "ten cents' worth a week." On Nov. 22, 1901, with a companion, he drank about one dozen bottles of Jamaica ginger bought at Cromwell. The following day the companion vomited freely, but his eyes did not suffer. The patient vomited "everything" the next day and his eyesight began to fail at once. On the second day he could distinguish only light from darkness, and remained in this condition for two days. Then improvement of vision began and continued until about Dec. 12, 1901, when V. = 2/200 (white letters) in either eye. Right half of each field was covered by a scotoma, the most acute vision being eccentric, to the nasal side of the fixation point. In the left eye the field is very little contracted; central vision is best. There is some tenderness above and behind the eyeballs. The patient gave the history just outlined and stated that immediately after the poisoning he had considerable pain in his eyes, which were too sore to touch. He was put on pilocarpin treatment, under care of the county physician, and on December 22 thought he could see a little better, but tests showed no improvement, and there has since been little change in his condition. Bilateral, post-neuritic optic atrophy.

**CASE 11.**—(From Dr. Coote of Quebec, and Dr. Frank Buller, Montreal, Canada.)

A man between 28 and 30 years of age, well built and healthy in appearance, without any history of a serious illness, while working in a lumbering camp, caught a slight cold. To cut the trouble short he took what he considered a big dose, about a wineglassful of methylated Jamaica ginger. He commenced to suffer from violent headaches and retching shortly afterwards. Some twelve or fourteen hours later his sight commenced to grow dim. A second dose was then taken and his sight grew worse. He was taken home and, with the exception of his eyes, he was shortly well again. About three months later, when he appeared at the hospital, central vision in both eyes was completely lost. Toward the periphery of the field of vision in both eyes a few patches of retina remained sensitive to light and fingers could be seen at a couple of feet. The pupils reacted to light and on convergence. Both discs were pale (not white) and the margins well defined; the arteries and veins were contracted, but, not equally; the media were clear. He was kept in the hospital for some weeks, but the treatment was of no avail.

**CASES 12 and 13.**—(From Dr. Homer Collins, Duluth, Minn.)

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CASE 14—(From Dr. W. G. Craig, Hartford, Conn.)

M. J., colored, aged 50, was given as a beverage a mixture of sugar, water and Columbian spirits, about three fluid ounces in all. This was on April 30, 1902. The dose was followed by nausea and vomiting and in twelve hours by complete loss of vision. She recovered her sight to some degree, but a month later it was only 1/4 in each eye. Nerve heads chalk white.

CASE 15—(From Dr. M. M. Cullom, Nashville, Tenn.)

While acting as interne in the Manhattan Eye and Ear Hospital, New York City, the following case came under Dr. Cullom's care:

In October, 1897, a workman was brought into the hospital with the following history: Two nights before he drank some wood alcohol in his room. It threw him into a stupor and, as he expressed it, "When he waked it was so dark that he supposed it was still night." He groped his way out into the hall and asked some one the time, and was informed that it was about 9 o'clock in the morning. The following day he was brought to the hospital. His pupils were widely dilated and did not respond to light. He had only perception of light in both eyes. The ophthalmoscope showed both nerve heads to be milk white in appearance and the entire fundus was blanched, the vessels being much smaller than normal. He was put on increasing doses of strychnia nitrate, administered hypodermically, which were carried to the physiologic limit. The vision improved for a short time until with his left eye he could count fingers, but the improvement was soon lost and he was discharged as hopelessly blind. There was no attempt made to secure a sample of the alcohol.

CASE 16—(From Dr. I. F. Dickson, Portland, Ore.)

Two teamsters, strong, healthy men, under 30 years of age, who had been working hard all night, arrived at a friend's house in the early morning, much fatigued. The friend offered them a drink of something that, he said, "would make them feel better." He accordingly prepared a mixture of wood alcohol and water sweetened with syrup. One man died toward evening. The other took only a few mouthfuls and spat some of it out, as he did not like the taste. Shortly afterward he became unconscious and remained so till next morning. When he awoke he could only distinguish light, and within three weeks the sight was entirely lost. About this time the discs began to show signs of atrophy; otherwise the fundi were normal. He was first seen by a physician shortly after taking the drink, when it was noticed that the pupils were slightly dilated, but nothing abnormal was then seen in the background of either eye and no fundus changes appeared for about three weeks. The latest report from the patient is that he is still totally blind.

The following case is of great interest owing to its early occurrence (1898). It was one of the first examples of blindness due to hay rum made from Columbian spirits:

CASE 17—(From Dr. J. A. Edwards, Columbia, Tenn.)

In February, 1898, he was called to Centerville, a town thirty-one miles distant, to see a young lawyer, W. A. K., aged about 26 years, who gave the following history: Living in a "dry" town and being in the habit of going on periodical sprees he called on a friendly physician who was in the habit of giving him a prescription containing alcohol and any other simple drug which would protect the druggist from prosecution for violation of the liquor laws. On this occasion he was given, to supply the needed alcoholic beverage, as well as to protect the druggist against the provisions of the prohibition law, the following prescription:

R. Bay rum ..... 2 fluid ounces.  
Alcohol ..... 4 fluid ounces.  
Sig.: To be applied externally.

He drank all this in an hour or so, and was afterward seized with violent pains in the stomach, nausea and vomiting, which continued about 24 hours, when he became totally blind. Dr. Edwards found him with pupils widely dilated and some tenderness of the globe on firm pressure. Having obtained the above history of his case the diagnosis of retro-bulbar

neuritis or toxic amblyopia was made. At that time very few reports of such cases had been published, but he was given an unfavorable prognosis, and was told that his vision would probably clear up in from ten to twenty days, but that blindness, either partial or complete, might recur from secondary changes in the optic nerve. The patient promised to call on Dr. Edwards in a few days, but saw, instead, another very competent oculist, under whose care for three or four weeks his vision cleared almost to normal. Very soon thereafter his sight again declined to 20/60, with scotomata in parts of the visual field. He still sees only well enough to read very large print, and that with much difficulty, on account of the scotomata. He practices his profession, but is very much handicapped, his wife being obliged to assist him in his legal work. Investigation developed that the "bay rum" in his prescription with which he was poisoned, was put up by a firm in Buffalo, N. Y., and made of Columbian spirits.

CASE 18—(From Dr. W. E. Driver, Norfolk, Va.)

J. B., male, white, age 25, U. S. sailor, brought July 12, 1898, from the U. S. Naval Hospital, by the surgeon in charge. He gave the following history: One week since the patient and two of his companions, who were in charge of a naphtha launch, indulged freely in the wood alcohol used in starting the engine. He and his companions were made desperately sick, and he became totally blind.

The pupils were widely dilated, but there was no visible pathologic change in the fundus. The diagnosis was wood alcohol amblyopia. Treatment was potassium iodid, ten grains three times a day at first; increased doses later. July 16, 1898, pupils still widely dilated. Had something more than light perception in each eye. Optic nerve, each eye, decidedly paler than at the previous visit. July 23, 1898, decided improvement in vision of each eye. Can now recognize large objects. Both pupils widely dilated. Eyes very bright. Both optic nerves show decided pathologic changes, and very much whiter than at previous visit. Dr. Driver learned from the Naval Hospital that soon after the last visit to his office, the patient was discharged from the Navy and nothing further was heard of his case. His two companions died during the debauch from the effect of the intoxication.

CASE 19—(From Dr. W. E. Driver, Norfolk, Va.)

A. H. S., male, white, aged 25, came Feb. 2, 1903. Referred to Dr. Driver by Dr. Holland of Holland, Va. The patient became suddenly blind ten days before. When he went to bed he could see as well as ever; on waking was totally blind. Had been drunk from cider purchased from a country store.

Right eye: Cornea very bright and glistening. Pupil widely dilated. Optic nerve pale, but no other pathologic change in fundus. No light perception. No reaction of pupil to light.

Left Eye: Cornea clear and bright. Pupil widely dilated. Nerve white. No reaction of pupil to light.

Diagnosis: Wood alcohol amblyopia.

Patient was sent to hospital and given potassium iodid, 10 grains three times daily, and twentieth of a grain of strychnin. On February 9 vision began to return in left eye. Has light perception. No improvement in right eye. February 15, counts fingers one foot from left eye. Light perception only in the right eye. Optic nerve, each eye, decidedly paler than normal. February 23 patient went home, with no improvement in the right eye, but counts fingers at three feet with left eye. Nerve each eye white, bluish tint. Pupils widely dilated. Corneal reflex extremely bright.

This man has consulted Dr. Driver three times since he left the hospital the first time. There has been no improvement in vision of the right eye. With left eye vision is 6/200.

CASE 20—(From Dr. William H. Dudley, Easton, Pa.)

Ralph W., single, aged 39, an essence pedler, about June 15, 1903, took for a "cold," diluted with water, four ounces of what he says he bought for grain alcohol. Two days later his vision became very bad, and when seen three months later, his optic discs were quite white; fields were narrow; vision 1/200 right and left. Seven months later his condition remained practically the same. Patient states that as soon as he had

If EtOH would Inhibit Oxidat. of the MeOH - Must Not be EtOH!

drunk the alcohol he discovered his mistake, realizing then that he had taken wood alcohol.

CASE 21.—(From Dr. H. P. Engle, Newton, Iowa.)

G. F. of Mingo, Iowa, aged 45, drank at least half a pint of Columbian spirits diluted. He lived forty-eight hours, but before death there were present gastrointestinal irritation, blindness, delirium and collapse.

CASES 22, 23 and 24.—(From Dr. W. H. Ford, Sulphur, Ind. Ter.)

As detailed elsewhere in this report, four men, aged from 30 to 40 years, went on a spree with methylated bay rum. Two, who consumed large quantities of the poisonous perfume, died. There is no history of blindness in one case, but the other, S. B. B., age 24, who succumbed to the poison, lived about eighteen hours, and suffered the most excruciating pain in stomach and bowels. Even though heroic doses of morphia, administered hypodermically, were given him, he had to be held in bed. He was totally blind most of this time. About an hour before death his pulse became imperceptible at the wrist, his heart being very rapid all the time. The odor of methyl alcohol was very noticeable in the perspiration, which was very profuse. The two that survived, aged 29 and 37, suffered for some twelve to fourteen days with marked ocular disturbances. Vision was very indistinct; it seemed at times as if they were "looking through a moving screen." Again, in a few hours there would be a total loss of the outlines of objects. After two weeks vision appeared to return.

CASE 25.—(From Dr. P. G. Goldsmith, Belleville, Ont., and Dr. Sprague, Stirling, Ont., and from the North Hastings Reporter, June 15, 1904.)

William Sutherland of Montegale met his death under very distressing circumstances on Monday night. He had returned from working with the chemical company near Orillia and brought a bottle of wood alcohol with him to let his neighbors see it. Not suspecting its poisonous nature he let some of them taste it. Finding it too strong, they were all satisfied with merely tasting it. But Sutherland, it is estimated, took about a wineglassful. In a short time he complained of difficulty in breathing, then of blindness, and asked for a physician, who was sent for. He soon lapsed into unconsciousness and died before medical aid could arrive. Deceased was a respectable farmer about 45 years of age, and a widower, having two sons. The sad event cast a gloom over the community.

CASE 26.—(From Dr. A. H. Gordon and Dr. Frank Buller, Montreal, Quebec.)

B. K., aged 40, female, domestic alcoholic. On Jan. 18, 1904, had been drinking for two days. Drank one quart of whiskey, a half-pint mixture of gin and spruce gum, as well as nearly eight ounces of wood alcohol. Vomited all one morning, and in the afternoon became excited, partially delirious. Complained of severe headache, pain in arms and fell to floor unconscious. Later, general convulsion and death in half an hour after convulsion. Half an hour before falling she groped about the room calling for light, evidently completely blind. Pupils widely dilated and inactive. The cause of death was undoubtedly the wood spirit drunk within twenty-four hours of her death. The autopsy showed no brain or kidney lesion.

(To be continued.)

## POISONING BY WOOD ALCOHOL.

CASES OF DEATH AND BLINDNESS FROM COLUMBIAN SPIRITS AND OTHER METHYLATED PREPARATIONS.

FRANK BULLER, M.D.

MONTREAL

AND

CASEY A. WOOD, M.D.

CHICAGO.

(Continued from page 977.)

CASES 27 and 28.—(From Dr. Frank A. Gray, Munising, Mich.; Dr. T. W. Scholten, Munising, Mich.)

J. R. and S. R., nationality French, occupation woodmen. Date of death, Nov. 14, 1898. L. R. aged 40, nationality French, occupation woodman, date of death, Nov. 14, 1898.

Symptoms in both cases, great suffering from pain in abdomen, especially in region of stomach, vomiting, severe headache, total blindness and severe prostration. The post-mortem findings consisted principally of a marked congestion of the gastric

and mesenteric vessels of liver, kidneys and vessels of brain. The conclusions arrived at were that while the local changes produced by this alcohol were quite prominent, death was undoubtedly due to the systemic effect of the poison. These two men who died from the poisoning were brothers. They came to Munising, went to a saloon and, as they stated, called for "good" alcohol. The saloonkeeper says he understood them to say "wood" alcohol. He not having alcohol in stock, went to a drug store and bought two quarts of wood alcohol for each. He delivered it to them and they left town in the evening and walked to camp. The alcohol was not labeled "poison." They both reached camp and were soon taken sick and Dr. G. M. Gould, formerly of Munising, was called to attend them. He found they had drunk a little less than two quarts between them. One of the men died about fourteen hours after they bought the alcohol and the other about seventeen hours after.

CASE 29.—(From Dr. Herbert Harlan, Baltimore.)

Storekeeper in Dorchester County, Maryland, went on a spree with Jamaica ginger. He became entirely blind, but is so ashamed of his performance and, believing his case to be hopeless, declines to see an oculist or to discuss his case with one. Dr. Harlan obtained the report from his family physician, whom he knows to be a competent and reliable observer.

CASE 30.—(From Dr. Herbert Harlan, Baltimore; Dr. P. B. Barringer, Charlottesville, Va., and Dr. Francis Lee Thurman, Keswick, Va.)

W. H. J., aged 38, a respectable and well-to-do merchant of Keswick, Va. Some five years ago, on a certain Sunday (July 15, 1899), not feeling well, took a drink of Gilbert's Jamaica ginger. After taking one dose he felt no better and took a second, later in the day taking several others. On the following day he took one more dose, drinking in all two or three ounces of the "ginger." On Monday he complained of nausea, weakness, vomiting, intense headache, giddiness and, later in the day, became blind. The blindness increased so much that in three days he could not perceive light from darkness. Then his vision gradually improved so that in another ten days it reached the acuity it at present exhibits. There has been no change in the fundus conditions during the past four years. He was then treated by Dr. Thurman and saw an oculist in Richmond, Va., whose name he did not recall. Two years afterward, when examined by Dr. Harlan, he had marked optic nerve atrophy, with some vision in the periphery of each field sufficient to allow him to get about in familiar localities.

Analysis of the Jamaica ginger taken by this patient showed that it was 70 per cent. wood alcohol.

CASE 31.—(From Drs. Alvin A. Hubbell and Lucien Howe, Buffalo, N. Y.)

Dr. B. W. S., Stockton, Chautauque County, N. Y., consulted Dr. Hubbell in April, 1901. In March, 1899, he accidentally drank about an ounce and a half of wood alcohol. This dose was repeated the next two days—three doses in all—after which his vision became dim in both eyes. He could see well enough to get about, but was unable to read print. V. R.

Analysis of the Jamaica ginger taken by this patient showed that it was 70 per cent. wood alcohol.

CASE 32.—(From Dr. M. A. Hughes, Salt Lake City, Utah.)

J. A., aged 40, stone mason, consulted Dr. Hughes in January, 1902, for a sudden attack of almost complete blindness. The history showed that he, with several companions, had drunk freely of wood alcohol on a certain Sunday. When he awoke next morning he found that he could scarcely see. On examination his vision was reduced to 10/60 in the right eye and 10/40 in the left. Under increasing doses of strychnia, given hypodermically, his sight improved slightly. A year after the poisoning he was, however, unable to resume his trade and the damage to sight seemed permanent.

CASE 33 and 34.—(From Dr. Edwin E. Jack, Boston, Mass.)

"I have seen two cases of atrophy following the ingestion of methyl alcohol in the crude form. One, J. P., aged 71, old soldier, bought a pint and drank part of it. Both had a long period of insensibility and both were blind on regaining their senses; a neuritis followed by rapid atrophy."

Although Dr. Jack was not able to find, in his hospital records, the detailed case histories of these patients, there is every reason to believe that they have not been published before and that they have not been duplicated in this report.

CASE 35.—(From Dr. Edward Jackson, Denver, Colo.)

A woman, addicted to alcoholism, resorted to a jug of wood alcohol that her employer kept for a lamp. The quantity taken is uncertain. She suffered from severe gastrointestinal irritation, vomiting and impairment of vision. Next morning all "looked black," but she could see a light brought into the room. In three days vision began to improve rapidly. On the eighteenth day V. = 4/60, R. and L. The optic discs were red, hazy and slightly swollen, their outlines hidden. The retinal vessels not much altered. She and her daughter said that before taking the wood alcohol she could thread the finest needle. She was not seen after the twentieth day.

As Dr. Hubbell saw him once only and as he failed to keep his promise to return, the visual fields were not measured. The fundi showed well-marked atrophy of both discs. Dr. Howe saw him before this, on June 12, 1899, and adds that, at that time, the patient thought his sight in the right eye had gradually improved. The right pupil was torpid, arteries small, discs pale; V. = 20/50 and Sn. three, field slightly contracted. In the left eye the same condition, only more exaggerated. Disc decidedly atrophic; V. = fingers at six feet; Sn. 20 at twelve inches; field regular, about two-thirds normal limit. In a letter to Dr. Howe from the patient six months later he reported his condition to be about the same.

CASE 36.—(From Dr. J. H. Jamar, Elkton, Md.)

A drunken male tramp, aged 37, having procured a quantity of wood alcohol, ostensibly for a different purpose, proceeded with a companion (whose case is elsewhere recorded), to go on a spree by the wayside. His female companion promptly died, but he survived, was placed in jail, there being no hospital in the city, and came under Dr. Jamar's care. The patient was found to be in a highly excited, delirious condition; face purple; decided odor of alcohol about him. Emetics followed by calmatives were prescribed and the patient began to improve. His eyesight was greatly affected for the first day or so, but improved in a few days, when he was discharged. The final outcome of the case as regards vision is not known.

CASE 37.—(From Dr. Dryden H. Lamb, Owosso, Mich.)

J. F., male, aged about 25, one of three men who together went on a spree. After having absorbed all the ordinary alcoholic beverages they secured some Columbian spirits and drank a considerable quantity of it; exact quantity is not known. One died shortly afterward and the others were very ill, both of the survivors suffering from amaurosis. One case was treated by Dr. Lamb, the other elsewhere. There was marked contraction of the fields in both eyes and vision was permanently reduced to 20/100 and 20/80, right and left eye respectively. Previous history good.

CASE 38.—(From Dr. Dryden H. Lamb, Owosso, Mich.)

J. B., aged 30, imbibed an unknown quantity of Columbian spirits and in a short time was totally disabled from loss of eyesight. R. E. V. was 20/200; L. E. V. was 10/200, with

analysis of the Jamaica ginger taken by this patient showed that it was 70 per cent. wood alcohol.

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narrowing of fields. Condition at present but slightly improved. Optic atrophy.  
 (CASES 39, 40 and 41.—(From Dr. Dryden H. Lamb, Owosso, Mich.)

Owing to destruction of complete records of these three cases (during two and one-half years' absence on military duty) Dr. Lamb is unable to give details of the visual fields, fundus changes, etc., but has a distinct recollection of the main facts, which point conclusively to methyl alcohol blindness. So far as Dr. Lamb knows, the cases are here published for the first time. About four years ago three Swedes, addicted to alcoholic debauches, purchased deodorized wood alcohol because it was cheap, reduced it with water and drank "not a large quantity" of it. The eyesight was affected in each instance and it was on account of this failure of vision that Dr. Lamb saw them. Central vision was greatly reduced, the visual fields were much contracted and the fundus pictures were those of optic atrophy. Under treatment vision improved somewhat in all the three instances, and when they could readily get about the men left town and have not been seen in Owosso since.

CASE 42.—(From Dr. Eugene Richards Lewis, Dubuque, Iowa.)

J. C., aged 38, chronic drunkard and loafer about saloons; also heavy smoker, with a "specific" history. At noon one day, while prowling about the house of a woman he had recently married, he discovered a large bottle of wood alcohol, of which he drank an unknown quantity. Toward evening Dr. J. S. Lewis of Dubuque was summoned and found the man totally blind. The patient died during the night, so that a fundus examination, which was arranged for the following morning, could not be made.

CASE 43.—(From Dr. F. Park Lewis, Buffalo, N. Y.)

M. F., aged 49 years, had used alcohol for thirty years and was in the habit of taking it to excess whenever opportunity offered. She was an inmate of the Erie County Hospital in the year 1900. One afternoon, finding a large cup half filled with what she supposed to be alcohol, and which was in fact methyl alcohol, used for cleaning purposes, she drank the whole of it in two draughts with an interval of about half an hour, the total amount consumed being about four ounces. After a short period of excitement she passed into a stupor which lasted until late the next morning when, on being aroused, she found herself absolutely blind, and from that period until the present time, about four years, she has had no perception of light whatever.

She did not come under the observation of Dr. Lewis until the beginning of his service, some six months after this event. Then both optic nerves were found to be atrophic and the retinal vessels reduced in size. The woman is still an inmate of the County Hospital. She has a catarrhal conjunctivitis, but otherwise is apparently in good health. No consequences seem to have followed the toxemia except the almost immediate complete and permanent blindness.

CASE 44.—(From Dr. J. A. Lippincott, Pittsburg, Pa.)

F. C., aged 47, laborer, drank a large quantity of wood alcohol and within twenty-four hours sight began gradually to fail and was never regained. No light perception. Pupils slightly dilated and rigid. The ophthalmoscope shows clear media. Discs a grayish silvery white, with sharply defined margins. Upper and lower temporal veins of normal caliber. All other vessels almost obliterated or reduced to mere threads.

CASE 45.—(From Dr. J. A. Lippincott, Pittsburg, Pa.)

J. R., aged 31, oil well driller, drank 24 ounces of Jamaica ginger between 2 and 3 o'clock in the afternoon. At midnight he awoke with severe browache and sight much impaired. In a few minutes he became stone-blind, in which condition he has remained ever since. External appearances are normal except that the pupils are dilated (5½ mm.) and not responsive. Tension slightly elevated, especially on right side. Eyeballs tender to touch, especially above. No light perception.

Ophthalmoscope examination: R. E., media clear; outer margin of disc perfectly sharp; upper margin very much blurred, the blurring extending upward, with radiations over the retina

for fully a disc diameter, but more pronounced, and extends downward 1½ disc diameters. In this area the retina is edematous and the vessels are interrupted in places. Inner side of retina slightly hazy. Macular region normal in appearance. L. E., disc slightly hazy and surrounded by a hazy zone about 1½ disc diameters wide. Retinal vessels slightly tortuous. Knee reflex absent.

Treatment: Iodid of potassium in large doses; leeches to temples; pilocarpin sweats daily; rest in bed; strychnin to be given a little later.

Feb. 25, 1901. V. R. E. = light perception. V. L. E. = fingers close to eye. Pupils still dilated, but responsive, though sluggish. R. E. disc bluish-white, with boundaries pretty sharply defined. Retinal vessels about two-thirds of normal size. L. E., swelling of nerve head much reduced, leaving central physiologic excavation white; rest of disc is of grayish-white color. Pilocarpin stopped. Iodid and strychnin continued.

April 23, 1901. He states that about five weeks ago could see well enough to walk about, but about that time the sight began to fail, until he became entirely blind. Dec. 10, 1901, pronounced atrophy of optic discs.

CASE 46.—(From Dr. R. S. Magee, Topeka, Kan.)

Mrs. S. P., aged 33, Topeka, consulted Dr. Magee on July 8, 1901. The patient had always had good vision until four weeks previous to this date. She suffered from painful menstruation, for which she was in the habit of taking whisky. A month before consulting the physician she discovered she had no whisky in the house, so drank instead a medicine glassful of wood alcohol diluted with the same quantity of water. This dose was taken in the evening just before retiring. The next morning she noticed decided dimness of vision, unaccompanied by pain in either eye. Dr. Magee found vision in the right eye to be 16/100; left eye 4/200. The mirror showed "woolly" discs and the remains of small hemorrhages in both fundi. He had an opportunity of seeing her once more, at a later date, and found central vision worse and gradually failing.

CASE 47.—(From Dr. J. G. McKinney, Barry, Ill.)

James Riffe, jeweler, drunkard, in the absence of whisky drank extract of lemon, which produced blindness, followed by death in less than two days. The extract of lemon was examined by an expert chemist and found to be composed almost entirely of wood alcohol.

CASE 48.—(From Dr. J. E. Minney, Topeka, Kan.)

As reported in another column, a farm hand, one of nine Poles, living in this vicinity, who indulged in a debauch and drank nearly two gallons of methyl alcohol before the termination of the spree, became blind. This was during the year 1889. The loss of vision in this instance was unequal, the one eye being much more affected than the other, although they both exhibited the fundus signs of optic nerve atrophy.

Dr. Minney saw the case first about ten weeks after the intoxication. The man was then able to go about the farm and do work not requiring good vision. The last report from him was that there was no improvement.

CASE 49.—(From Dr. T. W. Moore, Huntingdon, W. Va.)

G. S., aged 36, baker, was first seen Jan. 23, 1904. Drank an unknown quantity of wood alcohol Sept. 15, 1902, and was totally blind thereafter for nearly three weeks. Both discs are now pale, right one decidedly so. Vision: R. E., fingers at 12 inches; L. E., with lenses, 20/40.

CASE 50.—(From Dr. T. W. Moore, Huntingdon, W. Va.)

S. T., aged 45, white, house painter, married. Uses tobacco and alcohol, the latter to excess. Had been working in a frame factory and using wood alcohol in mixing his paints. On Oct. 6, 1900, he drank one-half pint of the methylated spirits. This was followed the next day by other alcoholics. Vomited excessively all that night, and on the following morning was totally blind. Had flashes of light before his eyes quite frequently; no pain at any time in eyes, although slight frontal headache. On October 18 Dr. Moore saw him for the first time. He had perception of light and said he could see moving objects, although he subsequently failed to do so in the physician's of

face. Pupils dilated and did not respond to light. Both discs were slightly blurred on the nasal side; arteries normal, veins engorged and tortuous. One year later the patient was still totally blind, and both discs were white.

CASE 51.—(From Dr. H. Moulton, Fort Smith, Ark.)

In addition to the cases reported by him in the *Ophthalmic Record* for July, 1899, and November, 1901, Dr. Moulton submits the following case history: S. W. McK., age 52, of San Bois, Ind. Ter., drank, April 22, 1902, four bottles of essence of lemon. Next day he began to lose his eyesight, and on the third day he was totally blind. After three or four days he began to see again. He reported that, as treatment, "his doctor made him sweat." On May 23, 1904, one month after the poisoning, Dr. Moulton found vision in his right eye to be 10/100; in the left, finger-counting at three feet. The ophthalmoscope showed temporal pallor of the nerve heads. The pupils were abnormally dilated. Unfortunately, the patient did not return, as arranged, to have his visual fields measured.

Dr. Moulton remarks that cases of poisoning from adulterated drinks are very common in Indian Territory.

He believes that at least 50 deaths have occurred in that country from this cause.

The sale of ordinary alcoholic beverages is strictly prohibited there by the United States Government, and thirsty souls are perforce obliged to drink anything containing alcohol, Jamaica ginger, witch hazel, or even "peruna."

CASE 52.—(From Dr. F. G. Murray, Cedar Rapids, Iowa.)

The patient was a cook (male) in a lumber camp in the summer of 1902, in northern Michigan. Previous to taking this job he had been indulging heavily in liquor, but had not had access to it for a number of days previous to his arrival at the camp. There was no liquor accessible nearer than the railroad station, 30 miles away. He seemed to have normal vision and command of his muscles at this time, for he did a little hunting and brought down game with a rifle at a moderately long range. This was the first of the week, in June, 1902. To satisfy his craving for alcohol, he commenced drinking a proprietary "liniment for both internal and external use" kept in the "van," or camp store. In the space of three or four days he drank at least 72 ounces of this remedy. He became weak and somewhat incoördinate in gait, and his eyesight began to fail, so that by the end of the week he could barely distinguish hand movements before his eyes. The pupils were widely dilated; the skin cool and moist. No ophthalmoscopic examination was made, and Dr. Murray does not remember whether there was or was not ptosis. The subsequent history of the case is not known. The patient went to Marquette, Mich., presumably to the hospital there. It was reported that he was seen some time after on the streets, with improved eyesight. There were, in addition to the "liniment," some common extracts used in cooking about the camp kitchen, but there is no evidence that he drank any of them. If he did, it was only a small amount.

The liniment referred to is largely used in the camps of that region (near Sault Ste. Marie) to "sober up" on, and it is a common belief among the woodsmen that free indulgence in it will cause blindness.

CASES 53, 54, 55.—(From Dr. Charles A. Oliver, Philadelphia, Pa.)

"I have had three indisputable cases: two at Wills Hospital and one in private consultation. Of the two public cases, one had his central vision reduced to 1/8 of normal; the other to 1/15, both by reason of large positive scotomata. Both patients, men of 30 and 35 years of age, were rendered practically useless for continuance of their daily work as skilled laborers. The private case, an important man in a not far distant community, was compelled to discontinue a remunerative employment for an extremely precarious and uncertain agency.

"The cases I saw were primarily mine, were never published, and will not interfere with Dr. Buller's statistics (of published cases). The histories of the public ones are buried in my special Wills Hospital case books. I used them alone for class demonstration. One case, I remember, was wood alcohol in coffee. I do not remember the amounts ingested."

CASE 56.—(From Dr. S. A. Oren, Lewiston, Ill.)

Frank H., aged 48, laborer, a habitual drunkard, had been on a spree, and after drinking freely of "lemon essence" was found, Nov. 4, 1903, in a barn unconscious. Dr. Oren saw him shortly afterward and endeavored to restore him, but without avail. He recovered sufficiently to articulate, but became delirious before he died, within 24 hours after finding him. He was quite blind before death. His pulse was very weak and did not respond to stimulants.

CASE 57.—(From Dr. C. E. Patterson, Grand Rapids, Mich.)

Mr. H., aged 17, an habitual drinker of spirits, consulted Dr. Patterson several years ago on account of the nervous symptoms engendered by this habit. He used to buy the pure alcohol, dilute it with water and drink it to complete intoxication. On one occasion a mistake was made, and he was given wood alcohol (probably deodorized), and, as usual, proceeded to imbibe it to full drunkenness. This was on a certain Friday night. He awoke next morning totally blind. He recovered from the other effects of his spree, but has never regained his eyesight, there being complete destruction of both optic nerves.

CASE 58.—(From Dr. J. A. Patton, Stilwell, Ind. Ter. Dr. T. S. Williams, Stilwell, Ind. Ter.)

P. F., aged 24, single. Dr. Patton saw him first Feb. 28, 1904, 9 a. m. He had vomited since 10 o'clock the night before, after drinking six or seven bottles of lemon extract. It was afterward learned that he had been drinking lemon extract for three or four days. Pulse, 80; temperature normal; respiration, 25; capillary circulation not good. Complained of some burning pain in stomach. Could see and recognize persons within a few feet of him, but at a distance of 10 or 12 feet, as he expressed it, "everything looked white." At 1 p. m. he was totally blind. Respiration very rapid; partly unconscious. Pulse, 65 or 70, but full. At 3 p. m., unconscious; pulse slow but strong; great dyspnea; skin cold and clammy. 5 p. m.—Had several severe convulsions. Died at 5:40 p. m., Feb. 28, 1904.

Dr. Patton had the lemon extract drunk by this man and by the patients whose cases are subsequently detailed by him in this report analyzed. It was found to consist largely of wood alcohol.

CASE 59.—(From Dr. J. A. Patton and Dr. T. S. Williams, Stilwell, Ind. Ter.)

W. H. H., aged 60, married, merchant. He had drunk lemon extract, with others, for three or four days. Complained to friends on the afternoon of February 29 that "everything looked white" and that he couldn't see well. Had vomiting and other gastrointestinal symptoms, such as severe cramps. He went home to his wife, who cared for him until 4 a. m., March 1, when physicians were called. At that time he was totally blind, unconscious and had a slow pulse; respirations labored. Died after convulsions, 8 a. m., March 1, 1904.

CASE 60.—(From Dr. J. A. Patton, Stilwell, Ind. Ter., and Dr. J. T. Clegg, Siloam Springs, Ark.)

S. T., aged 34, married. Had drunk lemon extract for three or four days. On the morning of Feb. 28, 1904, he went to Siloam Springs. He was apparently in good health and sober during the day. About 7 or 8 o'clock p. m. he went to the hotel and complained of blindness, dyspnea and pain in the stomach. Dr. J. T. Clegg of Siloam was called, who gave the following history: Respiration very labored, with a prolonged expiratory effort; pulse slow (48 to 50). Other symptoms closely resembled the foregoing case, with the exception of the muscular spasm; he had no convulsions. Died at 1:15 a. m., Feb. 29, 1904.

The lemon extract drunk by this patient was analyzed and found to contain wood alcohol.

CASE 61.—(From Dr. W. T. Salmon, Oklahoma City, Okla.)

H., aged 40, December, 1898. Drank alcohol, and in 12 hours was very dizzy, vomited a great deal, headache, eyeballs sensitive to touch, blind in three days, optic neuritis followed by atrophy.

CASE 62.—(From Dr. W. T. Salmon, Oklahoma City, Okla.)

Miss F., aged 19, lived in Indian Territory, February, 1899. Had been drinking cologne spirits. Suffered much with headache, eyes tender, gastric disturbances; blind in five days from time when she first noticed dimness of vision. Papillomacular atrophy.

CASE 63.—(From Dr. W. T. Salmon, Oklahoma City, Okla.)

H., aged 63, April, 1899. Drank "alcohol." Violent headaches and vomiting. Improved under pilocarpin and potassium iodid. Relapsed and vision was reduced to counting fingers in the left eye at three feet. R. E. = 20/200. Central scotoma; optic atrophy.

CASE 64.—(From Dr. W. T. Salmon, Oklahoma City, Okla.)

W., Indian Territory, aged 54, May, 1900. This man was one of a party that drank Columbian spirits on Sunday morning. Two stopped at a friend's house for dinner, ate heartily of wild turkey and never noticed any bad symptoms. Williams, however, continued his journey on horseback, riding nearly all day, taking three more small drinks (half a pint), and next morning had headache, dimness of vision, vomiting and was entirely blind in 48 hours. He improved slightly under pilocarpin and strychnia.

CASE 65.—(From Dr. W. T. Salmon, Oklahoma City, Okla.)  
K., aged 43, October, 1900, Indian Territory. Protracted spree with Jamaica ginger, lemon extract and "peruna." Noticed one morning that a cloud was before his eyes. He became blind in six hours afterward, had headache, vomiting and other gastrointestinal symptoms. The final outcome was optic atrophy, with narrowing of the retinal vessels.

CASE 66.—(From Dr. W. T. Salmon, Oklahoma City, Okla.)  
S., aged 56, October, 1899. Had been dyeing and cleaning clothes in alcoholic preparations. No evidence that he had drunk the methylated mixture. Headache and vomiting. Vision reduced to perception of light in ten days from first symptoms. Under pilocarpin he recovered most of his sight in 61 days.

CASE 67.—(From Dr. W. T. Salmon, Oklahoma City, Okla.)  
E., aged 24, January, 1901, Indian Territory. Drank one-half pint of "bitters." Next morning had headache, dimness of vision, vomiting, etc. In 48 hours V. R. E., counting fingers at three feet; L. E. = 20/200. Treatment consisted of pilocarpin, followed by strychnia. When last seen patient's sight was almost normal.

CASE 68.—(From Dr. W. T. Salmon, Oklahoma City, Okla.)  
M., aged 29, June, 1902, Indian Territory. Drank one pint of Columbian spirits. This was followed by vomiting and headache. Eyes tender on pressure. Result, much diminished vision, central scotoma and contracted fields.

CASE 69.—(From Dr. W. T. Salmon, Oklahoma City, Okla.)  
S., aged 34, August, 1902. This man drank four bottles of Jamaica ginger, and was found in a semi-comatose condition and totally blind. At first improvement occurred, but in a few days there was a relapse, followed by optic atrophy.

CASE 70.—(From Dr. Norman B. Saunders, Schenectady, N. Y.)

McA., aged 38, single, steamfitter, admitted to New York City Hospital, Aug. 5, 1902, in a condition of delirium due to alcohol. Under the use of large doses of strychnin and high intestinal irrigation he recovered and was subsequently employed as ward attendant. On the morning of Sept. 17, 1902, he was sent to the superintendent's office on account of intoxication the previous evening. He left the ward, but was soon brought back in a state of collapse by two patients. Pupils moderately dilated. Breathing labored and deep. Face flushed. Skin bathed in sweat. Was very restless. He complained of pain in stomach, was nauseated, and said he felt as if he was going to die. He then told the nurse that he had been drinking wood alcohol. Pulse quick and feeble; heart sounds very feeble. Patient said everything looked black; he was actually blind. Asked for water and stretched out his hand, grasping for water. Continued to moan and was restless. Soon had a spasm of muscles of clonic character, the forearm being flexed and drawn tight to the body; cyanotic during spasm; in a few minutes relaxed. In absolute coma. In five minutes another spasm; entire body stiffened; no opisthotonos. Death. The autopsy revealed nothing of importance.

CASE 71.—(From Dr. J. W. Scales, Pine Bluff, Ark.)

H. E., male, aged 46, a hard drinker. Complained of poor vision for a year previous to May, 1903. One evening in the course of one hour drank six ounces of wood alcohol and two of brandy. Felt "soggy," but ate supper, got up next morning and ate his breakfast and later his dinner, but about 3 p. m. (22 hours after drinking the alcohol) vomited severely, and at 5 p. m. he went to bed. He slept 24 hours, and on awakening found that he was entirely blind, and remained so for 36 hours. He then saw dim shadows with the left eye. In a month the right eye recognized hand movements. Vision continued to improve slowly for six months, but remained unaltered afterward. At the present time, R. E. = 1/20, L. E. = 1/10. No lens improves vision. Fields greatly contracted, irregularly concentric; all color perception lost. Optic discs very white, with sharp edges. Pupils, very sluggish reaction to light. Nine months later vision was unchanged, despite treatment, and the retinal vessels were narrow, as if there was some endovasculitis.

CASE 72.—(From Dr. J. W. Scales, Pine Bluff, Ark.)

M. O'C., aged 45, railroad section "boss," in December, 1900, drank three bottles of Jamaica ginger, followed by a smaller quantity of bay rum and Hostetter's bitters. During the night he was seized with violent headache and intestinal irritation. In the morning he was blind in both eyes, and, although the other symptoms shortly disappeared, he never recovered his eyesight, the blindness persisting until his death from pulmonary disease, two years later.

CASE 73.—(From Dr. K. W. Sneed, Wortham, Texas, and Dr. I. O. McReynolds, Dallas, Texas.)

A negro barber, a chronic alcoholic, had been in the habit of

drinking "almost everything," including "bitters" and other patent medicines, as stimulants. He bought some bay rum made with wood alcohol for use in his business. The druggist warned him of the poisonous character of the mixture, but he seems to have disregarded the warning and imbibed an unknown quantity of it on the night of July 30, 1904. At 5 o'clock next afternoon he complained of vertigo and almost total blindness. The following day at noon, when Dr. Sneed saw him, he was suffering from dyspnea, with respirations 10 a minute and very labored; pupils dilated and irresponsive to light; pulse, 104.

Examination showed no organic disease of heart; kidneys or lungs. On Sept. 3, 1904, his general condition had much improved, but his vision was no better. He could barely recognize the outlines of his room door.

CASE 74.—(From Dr. Eugene Smith, Detroit, Mich.)

April 19, 1903, Dr. Smith was consulted by Mr. A. L. B., aged 20, who stated that Feb. 8, 1903, he drank four or five tumblers of wood alcohol. On February 10 was "unable to see to get around." Dr. Smith found his vision to be only perception of light in the right eye; nerve white; all vessels attenuated. Left eye, V. = 10/200. Nerve waxy-white; vessels attenuated. Did not see patient again.

CASES 75, 76.—(Courtesy of the Surgeon General of the Army.)

A. and B. were admitted soon after noon on July 25, 1898, with symptoms of acute poisoning. Both men were able to walk into the ward, and admitted, when confronted with the query, that they had, in lieu of whisky, drunk wood alcohol diluted with water and sweetened. They were but two of a number of privates in this regiment who drank this concoction, but having indulged in it to much greater degree than almost any of the others they were more seriously affected. One of their companions did, however, die in his regimental hospital. The symptoms which these two men presented were gastric pain of an acute character, relieved at times by cessation of the pain; almost persistent vomiting, dryness of the mouth and throat, though the tongue and buccal cavity seemed moist. An insatiable and insatiable desire for water which is characteristic of poisoning cases of this class was noticeable in both men, who drank eagerly the water that was given them, only to vomit it a few moments after its reception into the stomach. Temperature of both men about normal when admitted, and did not rise above 99 at any time. The speech quite coherent, but the eyes with dilated pupils, incapable of recognizing either persons or things only a few feet distant. A., after an awful struggle, in which he tossed about incessantly, crying all the while for water, gradually sank into unconsciousness, in which state he died at 7:30 p. m. the same day. For an hour before death he was almost pulseless, heart dicrotic, and toward the last Cheyne-Stokes' breathing.

B. died at 2 a. m. on the morning of July 26, after evidencing practically the same effects of the poisoning as did A. His temperature at 9 p. m., five hours before death, registered 93.4, but after the application of hot-water bags rose to 95.3. It is believed that both men died from an acute nephritis, although necropsy was permitted. Both men, it was learned, had been drinking the wood alcohol for two days before admission; but no alarming symptoms made their appearance until the conclusion of 36 hours' time. A. died six hours after admission, and B. 13 hours after.

Treatment: Before admission strychnin hypodermatically for stimulation, and bismuth and egg albumin as a sedative and an emetic. At First Div. Hosp., strychnin, hot-water bags, friction and emulcents.

CASE 77.—(Courtesy of the Surgeon General and of the surgeon in charge of the post at Fort Terry, N. Y.)

Private T. H., aged 29. On the same night, Feb. 26, 1904, that four other soldiers had drunk methylated bay rum, he was found drunk and put in the guard house. He denied that he had taken any wood alcohol. Two days later he was reported to be in bad condition, and as having drunk some bay rum and Florida water while in confinement. When he was brought to the hospital he was in a state of partial collapse; temperature, 96; pulse, 80, weak; respiration about 12. Was given strychnin sulph. gr. 1/20 and whisky 8 c.c. hypodermatically; M. of oil tiglii in oil per orem; not applications to body. Bowels not responding in three hours, were emptied by enema, and later freed themselves of oil. Temperature rose to normal in one hour, pulse and respiration becoming stronger. Whisky and strychnin continued till next morning, when man complained of blindness in both eyes; otherwise much improved. As this man had a specific history, he was put on large and increasing

doses of potassium iodid and strychnin. At that time patient could not count fingers at all; light perception remained, but only in lower part of retina, the man having to cast his eyes strongly upward in order to see even light. Under treatment this condition improved for about a week, when it remained the same, though at this time he could count fingers at about 18 inches and could tell time on large-faced clock by putting face about 1 inch from face of clock and hunting each hand separately. April 16, as he showed no further signs of improvement, application was made to have him discharged from service. His retina at this time were congested and edematous, but the visual field was not tested, as he could not see sufficiently well for the purpose. Except for the amblyopia, the man returned to a normal condition, but was discharged April 26, for amblyopia caused by wood-alcohol poisoning.

The Columbian spirits taken by this man was bought as such by the company barber in a regular barbers' supply house and was intended for use in preparing his face preparations. He and four other soldiers (whose histories are elsewhere given) went into the barber shop and helped themselves to the stuff either through ignorance of its nature or through an uncontrollable desire to "taper off" from their spree, as most of them had been drinking heavily for a day or two previously. None of them took any wood alcohol after February 28; Nos. 1, 2, 3 and 5 only taking one or two drinks (mixing about 60 c.c. of the poison and an equal part of water). No. 4 took about a pint, the five drinking about a quart in all. Beside this, they drank "Florida water" and bay rum of cheap grades, which doubtless contained methyl alcohol in large proportions.

All of these men were what is known as "booze hoisters," and Nos. 1, 2, 3 and 5 had been drinking for several days before they took the wood alcohol, and had been on the sick report a number of times for acute alcoholism, yet they strenuously denied, all but No. 4, that they had taken any of the poison, and it was only found out positively at the court martial which followed. Only the Columbian spirits was tested; this was found to be nearly pure methyl alcohol; but the other preparations, being of inferior grade, it is supposed that the alcohol used in their manufacture was impure wood alcohol.

CASE 78.—(From Dr. Frank C. Todd, Minneapolis, Minn.)

H. T. J., aged 45, consulted Dr. Todd on the morning of Sept. 28, 1900. Occupation, painter for 33 years. Referred by Dr. L. B. Wilson. Patient denies syphilis; does not drink more than one glass of liquor in six months. Eyes and sight were normal on Monday, though the patient had suffered from a very bad cold in the head for two weeks. Has worked with wood alcohol frequently, but vision has never been affected, although he has many times been dizzy, and last summer had trouble in accurately determining colors when mixing paint, due probably to the absorption of evaporating alcohol or turpentine while working. Saturday being a rainy day, he did some varnishing with shellac in a small room, and inhaled the alcohol evaporating from the shellac; on Sunday this same work was continued. Patient had purchased what he supposed was pure alcohol, but which proved to be, on investigation, Columbian spirits. This was used in mixing his shellac. Not feeling well, he mixed some of the Columbian spirits with water and sugar, from which he sipped, drinking altogether a glassful or more (only a small portion of this glassful of water, sugar and alcohol was alcohol.) Tuesday, on awakening, he first noticed dimness of vision, and although it was morning he thought daylight had not yet come. He now could read signs, but not ordinary print. Sight was worse Tuesday night, and on Wednesday he could not see the firelight. He then consulted Dr. Wilson, who prescribed strychnin and referred him in consultation to Dr. Todd.

Examination Friday morning showed total blindness in both eyes; careful examination in dark room proved that he had no perception of light. Pupils, medium dilatation, no response. The following treatment was advised and carried out by Dr. Wilson: Catharsis, diaphoresis by the administration of pilocarpin, hypodermic injections of strychnin in increasing doses. After nine days of treatment patient first saw daylight; then his vision rapidly improved. Dr. Todd did not see him again until Nov. 5, 1900, when his sight, with glasses, became normal in every way.

CASE 79.—(From Dr. S. W. S. Toms, Nyack-on-Hudson, N. Y.)

A. B., servant, aged 45, addicted to alcoholism, in March, 1903, deliberately drank, during the absence of her mistress, nearly half a pint of wood alcohol from a bottle so labeled. Early the next morning Dr. Toms was called to see her, on account of what seemed a transitory blindness. This soon deepened, however, and was followed by excitation, which later

lapsed into coma, pulmonary edema and death. As the pupils became widely dilated an ophthalmoscopic examination was comparatively easy, but nothing abnormal was noticed in the fundus.

CASE 80.—(From Dr. J. F. Van Kirk, Whatcom, Wash.)

On Feb. 24, 1902, T. P. presented himself at Dr. Van Kirk's office with the following history: He was 38 years of age, a laborer, of not very good habits, but no history of syphilis. Had always enjoyed good health and exceptionally good vision. On Oct. 4, 1901, while employed as a watchman in a warehouse at St. Michaels, Alaska, he discovered a barrel labeled "Wood Alcohol." On this date, Oct. 4, 1901, he drank about one-half ounce, as he said, to "cure a cold." On Oct. 6, 1901, at 9 a. m., he drank about three-fourths ounce more, and again took a third drink of three-fourths ounce on the afternoon of the same day; in all, 2½ ounces in two days. On the night of October 6 he had occasion to rise, when it was discovered that he could not see a ray of light from the lighted candle in the room. At daybreak his vision had so returned that he was able to walk one-half mile to breakfast. He went about his work until noon, when he felt an oppression in the region of his stomach which prevented him from eating dinner. He continued at work for an hour after dinner, when objects began to look cloudy. This obscuration of his vision increased rapidly until 4 p. m., when he was obliged to stop work, and at 9 p. m. he again became totally blind, being unable to see light from a candle burning in the room. He remained blind from this date, October 7, until October 15, when he began to see a faint ray of light. On Oct. 18, 1901, he took the steamer for Seattle, Wash., where he arrived on October 30. During the voyage his vision so improved that he could walk around unaided. He began to work on the railroad section, but found his vision again slowly failing, more rapidly in the left eye. On Feb. 24, 1902, he came to Dr. Van Kirk for treatment. On examination he found R. E., V. = 20/30; L. E. V. = fingers at 5 feet. Entire lower field in each eye was obscured, with a small central scotoma in both. Color sense uncertain; eyes not tender nor sensitive to light. Right pupil somewhat contracted (or left dilated); both pupils reacted feebly to light, both directly and consensually. Media clear, fundus nearly normal, showing only a suspicious pallor, with arteries somewhat contracted. The discs were clearly atrophic and exhibited an ashy paleness. The treatment consisted of 1/30 gr. doses of strychnia sulph., which was later changed to increasing doses of potassium iodid, without appreciable change in the condition. This case was characterized by frequent transient changes. The vision would be markedly improved for a few hours, and then it would suddenly fail. Often the morning vision would be good, while exercise seemed to increase the amblyopia. The patient continued under Dr. Van Kirk's care until May, 1902, when, at Dr. Van Kirk's suggestion, he secured work on an ocean fishing boat. The marked improvement noticed while on his previous sea voyage was less noticeable now, but some transient benefit was apparent. The last report from him was dated late in the summer of 1902. Vision in the left eye was light perception only. Vision in the right eye was quite useful. The patient was unsteady, and apparently much worse when on land. At this time Dr. Van Kirk lost track of the patient, and has not heard from him since.

(To be continued.)

## POISONING BY WOOD ALCOHOL.

CASES OF DEATH AND BLINDNESS FROM COLUMBIAN SPIRITS AND OTHER METHYLATED PREPARATIONS.

FRANK BULLER, M.D.,  
MONTREAL,  
AND  
CASEY A. WOOD, M.D.,  
CHICAGO.

(Continued from page 1062.)

CASE 81.—(From Dr. John E. Weeks, New York City.)

E. V., aged 38, came to the New York Eye and Ear Infirmary, Dr. Weeks' service, Nov. 21, 1903. In the early part of August the patient suffered from intermittent fever, and on August 7 he drank a cupful of wood alcohol for the purpose of breaking up the fever. On the following day the vision of the left eye failed almost entirely, and the vision of the right eye became impaired. The maximum failure of vision was reached at the end of 48 hours. Since then, according to the patient's statement, there has been some improvement.

At the present time the vision of the right eye equals 30/40; the vision of the left eye equals fingers at eight feet. There is (see Fig. 1) concentric limitation of the field of vision, most marked in the left eye, an absolute central scotoma in the left eye and a relative central scotoma in the right eye.

The patient has been seen from time to time, and since November 21 the vision has remained approximately the same.

CASE 82.—(From Dr. D. Emmett Welsh, Grand Rapids, Mich.)

J. D., aged 15, living in the country, was in the habit of visiting quite frequently a neighboring village, where he acquired the drink habit. It was his custom to become intoxicated on wood alcohol, in the company of farm laborers, and sleep off his fits of indulgence in the barn. When at home he procured and drank Jamaica ginger. One morning after such a spree he awoke to find himself completely blind. Dr. Welsh was consulted some time afterward and found him very shaky and nervous, speech difficult, general muscular tremor, marked anemia and complete loss of vision in all parts of the field. The fundi exhibited white atrophy of both nerves. In spite of treatment, vision was not improved, and he was finally sent to one of the state institutions for the blind.

CASE 83.—(From Dr. D. Emmett Welsh, Grand Rapids, Mich.)

J. M., aged 14, acquired the drink habit and, "as it was so cheap," bought wood alcohol ostensibly for burning in a lamp, but really for use as a beverage. Previous to consulting Dr. Welsh he had never had any ocular defect. When seen he was totally blind in both eyes, but treatment improved his sight somewhat, until he now has about 3/200 in either eye. This boy exhibited the same degree of nervousness and anemia as the other boy, whose history is given elsewhere, and like him presented the fundus picture of optic atrophy.

CASE 84.—(From Dr. Joseph White, Richmond, Va.)

A young man, S. N., was brought to Dr. White June 22, 1897. On May 1 he drank quite a quantity of Jamaica ginger; it is not known exactly how much. The next morning, May 2, he woke up vomiting. He walked home, six miles, over the mountains and arrived there exhausted, with cold feet and legs. He went to bed sick and continued nauseated for three days, during which time his sight gradually left him. When he came to Dr. White his vision was so bad that he could hardly make out the 20/200 type at four inches. His fields, taken with a light, seemed to be very much contracted. The fundus was normal, except some pallor about the outer third of the disc. The diagnosis was retro-ocular neuritis, with atrophy of the papillo-

macular bundle. He remained under treatment for ten days and went home. The only information received from him subsequently was that he made no improvement whatsoever.

CASE 85.—(From Dr. Joseph White, Richmond, Va., and Dr. W. R. Williams, Richlands, Va.)

In March, 1898, Dr. White saw a young man, S. W., clerk, 21 years of age, who had been on a spree February 12, when he drank four bottles of essence of lemon, each bottle containing between two and three ounces. On Sunday morning at 10 o'clock he began to lose his vision. He also suffered great difficulty in breathing, the respirations reaching 40 to the minute, with no radial pulse, widely dilated pupils, general collapse and stupor. In spite of all treatment, he continued in a sort of stupor for two days. When he recovered from this mental condition he had no light perception. Five days later light perception began to return, and when Dr. White first examined him, three weeks afterward, his vision was 3/300. The pupils were widely dilated and not responsive to light, the retina was normal, the outer and central parts of the disc were bluish-white and slightly excavated. Dr. White made a diagnosis of optic atrophy from methyl alcohol. He heard from the physician who brought him, some time afterward, that the patient had made no improvement under treatment. In a report to Dr. White, dated May 8, 1904, Dr. Williams, who originally saw this case, says that the patient's vision improved for three or four months, so that he could resume his duties as clerk. However, he again took to drinking and smoking, his sight again deteriorated, fell to 3/20, and has so remained ever since.

CASE 86.—(From Dr. Jay Philon Whitney of Vinton, Iowa, and Dr. Lee Wallace Dean, Iowa City, Iowa.)

W. H., aged 37, married, printer, of regular habits up to 1900. At that time he began to drink whisky heavily and con-

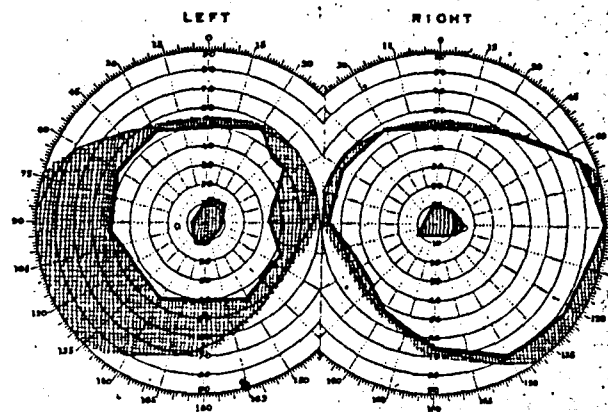


Figure 1.

tinued for about a year, when, on being refused liquor at various places, he began to take Jamaica ginger. He was soon refused this at the drug stores, but was in the habit of handing boys small sums of money and inducing them to obtain it for him. In the early months of 1901 he began to notice failing eyesight and consulted various opticians and oculists for relief, but obtained none. He complained that if he stood so as to look down at his type case that he could see fairly well, but on raising the eyes he noted a very distinct blurring. About April, 1902, after taking on Sunday a considerable quantity of peruna and Jamaica ginger, on attempting to go to his work on Monday morning he became entirely blind and had to be led back home. "I saw him one hour later; the vision was totally lost, the pupils did not respond to light and shade, dyspnea was urgent, pulse rapid, feeble and irregular; cyanosis was present, the extremities cool. From this precarious condition he rapidly recovered his vision and usual health, and returned to work in about ten days. In June of the same year, after drinking freely of Jamaica ginger on Thursday evening, he awoke the next morning to find himself entirely blind. I saw him about one hour later; the same symptoms were present as in the first attack, but coma supervened about 1 p. m., and he died quietly about 5 p. m."

CASE 87.—(From Dr. Jay Philon Whitney, Vinton, Iowa, and Dr. Lee Wallace Dean, Iowa City, Iowa.)

C. F., aged 36, married, printer, of regular habits, except an occasional prolonged spree; no eye defect. About Jan. 15, 1903, began to drink whisky heavily and continued for two weeks, when he was unable to obtain any more liquor. He sobered up at that time and remained sober until Feb. 4, 1903. About 7 o'clock that evening he called on his former employer,

arranged to take up his work again and remained with him until 9 o'clock. At 11 o'clock, according to the testimony of his landlord, he returned to his hotel somewhat the worse for liquor and went to bed unassisted. On the following morning he awoke to find that he was totally blind. He managed to get into his clothing and reach the hotel office unassisted. His employer was telephoned for and saw him 30 minutes later. The patient told him that on the night previous, after leaving his office, he fell in with some kindred spirits and drank one dozen small bottles of essence of lemon. At that time he had an essence of lemon bottle with a small quantity in it on his person. He was then entirely blind, dyspneic and cyanotic; the extremities were cool. He felt a sense of impending dissolution and desired that his people be communicated with. An attempt was made to get him back to his room, but on the first landing he had a convulsive seizure and they were obliged to carry him the rest of the way. The dyspnea and cyanosis increased, the extremities became quite cold, and he died quietly at 11 a. m. Dr. C. C. Griffin, Jr., and Dr. A. R. Fellows also saw this man.

CASE 88.—(From Dr. James P. Widmeyer, Rolla, N. D.)

One of at least ten Indians of the Turtle Mountain Reservation, who went on a spree with lemon extract and Florida water, drank half a teacupful of the latter. He had intestinal pains, burning in his stomach and nausea. After walking a couple of miles from the scene of the spree he vomited freely and did not suffer as did his nine companions, who all died. Along with the blindness (exact details of which could not be obtained) he had a marked dysuria. One other survivor also complained of difficulty in passing his urine. The poison was drunk Aug. 31, 1904, and the amblyopia was noticed a few days afterward.

CASE 89.—(From Dr. Hiram Woods, Baltimore, Md.)

"The wife of a laboring man, to improve her digestion, has been in the habit, at intervals for several years, of taking three or four tablespoonfuls of Jamaica ginger daily. She is about 40 years of age and her husband now reports that her sight has recently failed and that attempts to obtain glasses to improve it have met with no success. He also said that she sees better to one side than straight ahead. So far he has not brought the patient to my office, as I urged him to do, and I can not speak more definitely, but the case certainly looks like one of methyl alcohol amblyopia."

CASE 90.—(From Dr. Emil Bories, Seattle, Wash. Reported by Dr. Hamilton Stillson, Seattle, Wash.)

On May 23, 1903, Dr. Bories was called to attend S. M., German, aged 32, painter by trade, who had drunk about three ounces of Columbian spirits (wood alcohol), the same being used in the shop for dissolving shellac. Had frequently drunk alcohol in large quantities, and not being able to read the English labels, and supposing from the smell that the stuff was alcohol, he drank it, not knowing it was poisonous. Dr. Bories found him at his residence, where his fellow workmen had taken him. They noticed that he acted very strangely and, becoming alarmed, carried him to his home. One of the workmen stated that he had seen him drink alcohol before, but had never seen him so affected by it. General symptoms, pulse very weak and became countless, temperature subnormal for nearly three days; total blindness, could not discern light; had a ghastly, vacant expression; sighed often and deeply; lips bloodless. In dread of dying; was getting weaker; could not extend his hand; respiration stertorous; movements of limbs convulsive, constantly jerking; speech finally inaudible. Gave him at once 1/60 strychnin and pilocarpin, had him wrapped in blankets which had been wrung out of hot water, syphon to stomach; followed the same by pouring down about 6 ounces of hot, strong, unsweetened coffee, which was retained. Gave him a large enema of salt water. Also gave hypodermic injections of glonoin and had ice-bags placed on top of head and spine. Instructed wife and friends to rub the body well and constantly. Pupils dilated, conjunctiva very much inflamed. After two hours of hard work he showed signs of returning sensibility. One pupil contracted, but the other remained dilated. Lips showed better circulation, body became warmer and he was able to answer questions coherently, but was not able to discern light, although a bright electric light was burning. The following morning he was much better and retained nourishment. Blindness continued for three weeks, when sight was gradually restored. Dr. Kibbe saw the patient three days after he was taken home and advised a continuation of treatment. About ten days after, at the suggestion of Dr. Kibbe, performed venesection, without beneficial results.

(C) CASES HITHERTO UNPUBLISHED OF BLINDNESS FROM METHYL ALCOHOL ADSORBED BY THE LUNGS

OR SKIN, OR BOTTL.

CASE 1.—(From Dr. W. McL. Ayres, Cincinnati, O.)

W. E. C., aged 44, painter. Six or eight years ago had symptoms of lead poisoning, but his eyes were unaffected by this intoxication and were, so far as he knew, perfectly healthy. Shortly before he was seen by Dr. Ayres (October, 1901), he had been varnishing and shellacing the inside of the closets in one of the large Cincinnati hotels. The shellac had been cut by, or dissolved in, wood alcohol instead of grain alcohol. While in one of the closets he became dizzy, had an intense headache and was forced to stop for a time and get some fresh air. After this he returned to work, but was again attacked by nausea, vomiting and headache, that forced him to discontinue his work entirely for several days. On the third or fourth day his eyesight began to fail, and at the end of a week central vision was 5/100 in each eye.

Examination with the ophthalmoscope disclosed a double optic neuritis, which in a few months was followed by partial atrophy, with a large central scotoma in both eyes. At present he is practically helpless and unable to do any work requiring the use of his eyes.

CASE 2.—(From Dr. Daniel Conboy, Bad Axe, Mich.)

On Nov. 3, 1903, a call was received to visit Mrs. H., aged 58, bright and intelligent, and withal good looking, the latter partly due to the good (though on this occasion, unfortunately, excessive) care she took of her complexion. She was found with sight very much diminished, "almost blind," as she described her condition, central acuity being especially impaired. A large parlor coal-burner about 10 feet distant was recognized by its outline only. The eyes of a person four feet distant appeared like dark spots on a white background, no color or form being distinguishable. This fact, after the exclusion of nephritic and diabetic retinitis by urinalysis, led to a provisional diagnosis of an ocular affection of toxic origin. The trouble had been coming on gradually for two weeks. She also had had vertigo occasionally, particularly at church, and would have fallen the Sunday morning previous had it not been for her husband's help. Autointoxication was suspected, but nothing abnormal was discovered about the digestive tract. Inquiry was then made with regard to the use of Jamaica ginger, with the explanation that the essence of Jamaica ginger, of lemon and similar flavoring and culinary mixtures sometimes contained methyl alcohol, which might cause the condition from which she was suffering. The patient immediately raised her hands in surprise, and stated that she had been using wood alcohol for weeks, both for heating her rheumatic bath and as a cleansing application to her head and face daily, especially on Sunday mornings before church. The alcohol was at once discontinued and sodium salicylate administered *ter in die* after meals. The usual diminution of sight was arrested immediately, but the impaired vision remained *in statu quo* for four or five days, when it began to improve. Both on account of her blindness and the continuous stormy weather, she was unable for over a week to come to the office for ophthalmologic examination. The fundi even then presented an interesting picture. The temporal half of each optic disc showed a pallor very much emphasized by the hyperemia and neuritis of the remaining part. At the first office examination, nearly two weeks after patient was seen, the vision for distance was R. 7/40 and L. 7/50. On November 18, R. = 7/30, and L. = 7/30. On the 24th, R. was 7/20 and L. 7/30. December 3, one month after first visit, R. = 7/20 and L. = 7/30. December 7, R. = 7/20 and L. = 7/30. December 9, R. = 7/20 and L. = 7/30. The last examination was on December 18, when both R. and L. were 8/20, which the patient thought was about the same vision that had existed before she used the "nasty stuff." When the papillitis had vanished from both fundi, strychnin in increasing doses was administered in the hope of preventing optic atrophy.

CASE 3.—(From Dr. W. E. Driver, Norfolk, Va.)

E. L., male, white, aged 54, consulted Dr. Driver on June 15, 1901. He gave the following history: In August, 1894, after shellacing the benches and interiors of several school houses he awakened in the morning of the second night to find that he was totally blind. Prior to that time he had not had trouble with his vision. He remained totally blind for about two weeks, when the sight began to improve, especially in the left eye. He thinks the vision in the left eye has improved somewhat during the past two years. The shellac used had been dissolved in wood alcohol.

The general appearance of the eye was that of ordinary nerve atrophy. The pupils were widely dilated and the cornea appeared unusually bright. Right eye, V. = light perception. Iris slightly active to light. Optic nerve bluish-white, showing marked atrophic condition. Tension normal. Left eye, V. = 20/100; with +50 D. Sph. = 20/70. Cornea very bright and clear. Pupil widely dilated, as in the right eye. Iris slightly active to light. Optic nerve white, showing marked atrophic condition. No other visible disease of fundus.

The diagnosis was optic nerve atrophy from inhalation of wood alcohol.

CASE 4.—(From Dr. Harold Gifford, Omaha, Neb.)

A woman of about 35 came in the spring of 1902, complaining of gradual loss of sight for the past two weeks. Dr. Gifford found the fundus of each eye normal, except for a slight pallor of the outer quadrant of each disc, which might easily be physiologic. Vision, 20/200, each eye, not improved by glasses. Outer limits of the fields normal, but the center of each field showed a large relative scotoma about 30 degrees in diameter, in the center of which the color sense was practically abolished. On being questioned about the possibility of methyl alcohol poisoning, she positively denied ever having drunk methyl or any other alcohol, or any of the various commercial products which are apt to be adulterated with it; but she had been burning methyl alcohol in an alcohol lamp with a large, flat wick for heating water in her room. Her custom for two or three months had been to light the lamp nearly every evening and allow it to burn out. This was during the winter season, in a small bedroom, without any other fire, so that it can easily be imagined that the ventilation must have been somewhat defective. She had nothing else wrong with her that could be discovered. Her vision began to improve almost immediately after Dr. Gifford advised her to stop burning the methyl alcohol, when it gradually rose to 20/20 in the right eye and 20/70 in the left (the left eye had had convergent squint since childhood.) It seems probable, therefore, that the amblyopia was due to the fumes of the methyl alcohol or to the formaldehyd generated in burning it. Considering the relative quantities of the substances which must have been present in the air of the room, it seems more likely to have been the formaldehyd; but whatever the fact in this respect, the case suggests an additional way in which the eyesight can be injured by this villainous stuff.

CASE 5.—(From Dr. J. A. Lippincott, Pittsburg, Pa.)

S. E. S., aged 44, April 12, 1902, worked a whole day varnishing tanks in a brewery, using a varnish which had been mixed with wood alcohol. In the evening when he left his work—according to the statement of his physician, Dr. Brock of Waynesburg—he acted like an intoxicated man, and two hours later went into a comatose condition, which lasted 24 hours. When aroused the sight of the right eye was somewhat impaired and that of the left eye was entirely gone. His vision since then has improved considerably. The pupils on both sides small (2 mm.) and sluggish. T. normal. R. E., V. = 15/lxxx. No glass helps. Field of right eye shows moderate concentric limitation. That of left a more decided contraction, and also a small complete central scotoma. The ophthalmoscope showed right disc hazy, left swollen and blurred at margins and vessels tortuous. Advised iodid of potassium, salicylate of soda and nux vomica. June 24, 1904—Did not see the man subsequently, but Dr. Brock, in reply to a recent note, states that the vision of the left eye in time failed entirely. He also states that soon after the poisoning he was taken with left-sided pneumonia, from which recovery was never complete. About six months ago tubercular trouble developed and ended in death June 8, 1904.

CASE 6.—(From Dr. Nelson L. North, Jr., Brooklyn, N. Y.)

H. E. W., German, aged 48; not robust, light weight and poorly nourished. He was employed, with a companion (to whose history this one bears a close resemblance), as a varnisher of closed beer vats. These vats were badly (if at all) provided with ventilation; and wood alcohol was employed to dissolve the shellac used in the varnish. While engaged in this work he experienced the usual constitutional symptoms of methyl alcohol intoxication, and he began to have foggy vision. When seen in hospital by Dr. North, central acuity had fallen to 20/70 in each eye. Optic papillae pale. Fortunately, in this case prompt treatment was followed by improvement to almost normal in either eye.

CASE 7.—(From Dr. Nelson L. North, Jr., Brooklyn, N. Y.)

A. H. S., German, aged 35, strong and healthy, weighed 190 pounds. He was employed as a beer vat shellacer. During the winter of 1900-1901 he was engaged in his employment of var-

nishing the interior of ill-ventilated vats with shellac dissolved in wood alcohol. He began to suffer from loss of eyesight, and when seen by Dr. North his vision was 10/200 and there was every indication of optic atrophy, the discs being very white. Abstinence from work and long-continued treatment brought about some amelioration of vision; but improvement of central sight did not extend beyond 20/50.

CASE 8.—(From Dr. W. T. Salmon, Oklahoma City, Okla.)

A. J., infant, 6 months old, December, 1903. Parents noticed something wrong with the eyes and thought she could not see. Pupils contracted. After dilatation optic discs were found to be pale, more so on the temporal sides, and the arteries narrow. Parents said they had been burning a wood alcohol lamp by the crib in which the infant slept. Discontinued lamp, and child improved slowly. Total recovery.

CASE 9.—(From Dr. Norton L. Wilson, Elizabeth, N. J.)

O. E. H., aged 42, workman in the cabinet department of a large factory where Columbian spirits were used in mixing shellac and other polishing mixtures. His vision was reduced to 10/200. His discs were pale and the vessels were small. He was also a whisky drinker, but said he never drank wood alcohol to his knowledge. He probably absorbed it through his hands, as he frequently bathed his hands in Columbian spirits to "cut" the shellac.

It has been claimed by some observers that serious intoxication from inhalation or from "alcohol rubs" is not only highly improbable, but that its occurrence has not as yet been experimentally proven. They assert that sufferers from methyl alcohol blindness who have been working with the poison in closely confined chambers have drunk some of the methylated liquor and have suppressed the fact. Moreover, the amount actually absorbed must have been too small to produce serious effects. It is further claimed that amblyopia among workers in hat factories, where the air is highly charged with the fumes of methylated spirits used in dissolving the resins required for "stiffening" the straw, rarely or never occurs.

On the other hand, many of the alleged cases are so well authenticated; a few of them have occurred in children; it is well known that in those people who are not immune to the poison a very small quantity of methyl alcohol is sufficient to produce blindness, and finally, the absorption of rebreathed air with wood spirit fumes certainly adds to the toxicity of the latter; in hat factories, also, the fumes are constantly diluted by fresh air. If this be true of wood alcohol inhalation, it is probably also true, albeit to a less degree, of the poison absorbed by the skin. On the whole, we must conclude that it is safer to avoid absorption of the poison in any of its forms.

#### (D) CASES (HITHERTO UNPUBLISHED) OF DEATH FROM METHYL ALCOHOL POISONING, WITHOUT HISTORY OF PREVIOUS BLINDNESS.

CASE 1.—(From Dr. Emil Bories, Seattle, Wash. Reported by Dr. Hamilton Stillson, Seattle, Wash.)

J. F., Irish, tramp by occupation, was, Feb. 8, 1902, picked up in an alley in a state of collapse after drinking a large quantity of "union spirits" (wood alcohol). When found he had a bottle in his pocket which originally contained about four ounces, from which at least one-half had been taken. He was taken to the city jail. No method of treatment sufficed to revive him, and he died about 45 minutes after reaching the jail. Pupils widely dilated, bloody mucus running from mouth, involuntary defecations from bowels. Patient was a well-built and apparently robust man.

CASE 2.—(From Dr. Randolph Brunson, Chicago.)

B. M., a negro woman, aged about 40, was in good health and apparently had no organic lesions of any kind. She was in the habit occasionally of getting on a "spre" of two or three days' duration, drinking whisky. After having been on one of these debauches two days, she was found on her bed uncon-

4 As taking a drink from the supply of alcohol kept for dissolving the gums used in making varnishes is a very common habit among varnishers, it is probable that this patient drank wood alcohol, thinking it was ethyl spirits, or not knowing that the solvent was poisonous.—C. A. W.

