

THE ILLINOIS MEDICAL JOURNAL.

authority was the medical journal which I obtained last week, and in which paper it was stated that this Board had established reciprocal relations by which their licenses should be recognized.

I neglected to mention, but I was aware of the fact that husband and wife are jointly liable for medicines furnished either, or to the family.

In reference to the last point made, in reference to the effect of a judgment stopping a malpractice suit, since I finished my paper, I conferred with some of the leading lawyers in our city—and by the way, just here, in confirmation of what Dr. Harrah says about the infrequency of malpractice suits in this state, you will find if you ask the average lawyer any question bearing upon this subject as related to the doctor, that he will tell you that he will have to look it up. They are not quite sure about any point without reference to their authorities. Mr. Jones looked up a case I gave him and wrote hastily on the bottom of the note, "By analogy, I think the New York principle would be held in Illinois. A very hasty examination shows me no case precisely in point." Then he refers me to a case cited in the Report of the Illinois Court of Appeals, *Vigent vs. Scully*, Thirty-fifth Illinois Appellate Court, Page 44. That was an action for damages alleged to have arisen from negligent work in failing properly to supervise the construction of a certain building. It seems to me that if it is true with an architect, it is equally true with a physician—that the recovery of his fee bars any action against him for damages due to unskillful service. I am not advised as to whether any peaceable settlement has the same effect, but I should imagine that it does not unless it has been confirmed by the decision of the Court. *

ON THE TOXICITY OF METHYL ALCOHOL IN EXTRACTS AND MEDICINE.*

BY R. H. MAIN, M. D., BARRY.

On Feb. 18, 1903, I was asked to call and see James H. Riffe who had just "gone blind." I had known him personally for eight years. His family history was good—his health was excellent. He was a watch-finder by profession, aged 44. He was an inebriate and gave me the following history: For several days, being unable to get whisky, he had been drinking lemon extract. On the 17th his sight began to fail and he retained some peripheral vision and at noon stopped drinking. On the morning of the 18th the central vision was gone but he re-

the 18th he was blind. I was called at 6 P. M.

The clinical picture was characteristic. The mental faculties were but slightly impaired—the pupils were widely dilated and he could not distinguish light at all. A lamp held six inches from his face did not change the pupil and could not be seen. He was totally blind and said everything was black. There was frontal headache, nausea, rapid pulse, labored breathing and great restlessness. He was cyanosed and scared. An ophthalmoscope was not at hand at the time and the retina was not examined. His condition grew rapidly worse,—his suffering became agonizing and he died at midnight after a short coma, apparently of respiratory paralysis. It was a classical picture of methyl alcohol poisoning. My friend, Dr. Beavers, was present when he died.

I at once secured a number of samples of the brand of lemon extract he had been drinking, ("Good Hope," Quincy Grocery Co.) distilled it and examined it according to the test of Mr. W. Young (U. S. Dispensatory) and found it to contain methyl alcohol.

A coroner's jury found that "death was caused by drinking lemon extract."

With the assistance of my friend, Mr. E. W. Baker, I made a series of investigations of various culinary extracts and I was surprised to find that many of them were made from methyl alcohol although professed to be made in accordance with the pure food law of Illinois. I called the attention of the pure food commission to the matter and sent samples of the particular extract ("Good Hope") to Dr. E. N. Eaton, State Analyst, at Chicago and after considerable delay and several requests he reported that the extract was made from methyl alcohol—stating, however, that "our food law has no specific statute on lemon extract—A ruling of the commission requires 5 per cent oil of lemon * * If our law made the pharmacopoeia method of preparation the standard we would not need to bother ourselves about the toxicity of methyl alcohol as the pharmacopoeia stipulates cologne spirits—intimating that here their duties ended.

*Read before the Pike County Medical Society at Pittsfield, Ill., April 23, 1903.

There is a widespread belief among the people here that lemon extract is poisonous. This impression is due to a number of deaths resulting from its overuse. Cases similar to the one I have reported have occurred at intervals in the last five years. Dr. H. T. Duffield, Pittsfield, Ill., wrote me of a man who drank lemon extract and was found dead. Dr. E. W. Miller, Columbus, Ill., reported to me (personal communication) a case of methyl alcohol poisoning resembling minutely the one I have reported. Dr. J. Smith Thomas of Pleasant Hill reported a case of a man who drank a quantity of lemon extract at night and was found dead in bed in the morning. I have received reports, also, of deaths from drinking lemon extract at Beverly and at Baylis, Ill., and in both cases the clinical picture was that of methyl alcohol poisoning.

The use of methyl alcohol in food and medicine is evidently of recent development from the fact that prior to 1897 few cases of its poisoning are reported. So far as I know the first case is reported by Mengin, in 1877, of a convict who drank wood alcohol and went blind. This case is mentioned in recent monographs of Dr. DeSchweinitz and Casey A. Wood. Since 1897, however, numerous and more numerous cases are reported until the frequency is becoming alarming. Its use in culinary extracts and beverages such as Ess. peppermint, Ess. Jamaica ginger, ext. lemon, etc., seems to have emanated from Baltimore for it was in the "dry towns" of that vicinity that the first cases of blindness and death were reported from drinking Jamaica ginger, etc.

This fact, that most cases of poisoning by methyl alcohol occur in "dry towns" or in places where other liquor cannot be easily secured, will also account for the want of clinical observation in medical centers. This may also in a measure account for the "difference of opinion" which our pure food commission says exists among "medical authorities" concerning its toxicity. In reply to some letters of inquiry concerning the toxicity of methyl alcohol I have received a number of letters like the following:

1. W. Simon, Professor of Chemistry and Toxicology, College of Physicians and Surgeons, Baltimore, Md. "I am not in a position to give you any information, from personal experience, on the toxicity of methyl alcohol."

2. Justin Steer, Washington University, St. Louis. "I am sorry to say that I can give you no information, from personal observation, concerning the toxicity of methyl alcohol."

3. Frank Billings, Dean, Rush Medical College, Chicago. "I can give you no information, from personal observation, of the toxicity of methyl alcohol."

4. Frank M. Fuller, Professor of Chemistry and Toxicology, Keokuk Medical College. "I am sorry that I am unable to give you any information from personal observation, concerning the toxicity of methyl alcohol;" but Dr. Fuller adds a clinical picture of its toxic effects.

5. Prof. John H. Long, Northwestern University, Chicago. "I have had no personal experience with methyl alcohol but it is generally regarded as decidedly poisonous; this seems to be true of the purified product as well as the crude."

This dearth of clinical observation in medical centres is significant.

The decided toxicity of methyl alcohol is very generally conceded by the medical profession everywhere except by those "experts" who are hired by manufacturers to prove its harmlessness. The primary effect of the ingestion of methyl alcohol is that of the grain alcohol i. e. it will produce drunkenness in proportion to the amount taken. This is from the testimony of a number of persons who drank a quantity. Then if it is not more poisonous than ethyl alcohol but is only an intoxicant in the same measure why should it escape a federal tax? The assumption that it is not more poisonous than the ethyl alcohol, however, is not true as I intend to show although some persons seem more susceptible to its effects than others.

1. The first report of methyl "extract" poisoning that came to my notice was reported by Dr. A. G. Thompson, of Philadelphia, before the Philadelphia County

Medical Society and published in "The Medical & Surgical Reporter (Philad.) July 24, 1897, entitled "A Case of Complete Blindness due to acute poisoning from overuse of Jamaica ginger" in which Dr. Thompson did not seem to know what element in the Jamaica ginger could have produced the blindness and was at a loss to account for it but later this same case was reported by Dr. Thompson in Ophthalmic Record (Chicago) Nov. 1897, and the blindness was shown to be due to methyl alcohol.

2. "A case of blindness by ingestion of wood alcohol" in which blindness was permanent is reported in Ophthalmic Record, (Chicago) by Dr. H. Gifford, September, 1899. (Jour. A. M. A.)

3. In Journal A. M. A., December 30, 1899, page 1653, is a report by Dr. Casey A. Wood, before the Chicago Ophthalmic and Otological Society of two cases of methyl alcohol amaurosis from inhalation while working in a beer vat with shellac dissolved in wood alcohol.

4. Abstract in Journal A. M. A. from Ophthalmic Record December, 1899, of reports by Raub of:

a. "Blindness from methyl alcohol." A man on the night of October 4, 1898 drank two to five teaspoonfuls of wood alcohol and on the following morning his vision was impaired, it improved for a time under treatment, then gradually faded away and was lost.

b. Also a case in which three men in U. S. Navy, who on July 4, 1898, drank a mixture of methyl alcohol and benzine, were received on the hospital ship July 5th. One was unconscious and died in a few hours. Another suffered from gastro-enteritis only while the third was semi-conscious, pupils widely dilated and remained so. On the 8th he partially regained consciousness but was totally blind. He regained a part of his vision for a time but it was subsequently permanently lost.

5. In Journal A. M. A., January 5, 1901, page 34, appeared an article by Dr. Edward Stiner of Pittsburg reporting a case of "Amblyopia following the intoxicating use of Jamaica ginger" in which the writer does

not seem to be aware of the probable presence of methyl alcohol in the Jamaica ginger but in an editorial on this same case and others in Journal A. M. A., February 23, 1901, on "Jamaica ginger drinkers amblyopia" the cause is shown to be methyl alcohol.

6. In Ophthalmic Record, February, 1901, Journal A. M. A., Dr. Herbert Harlan reports cases of "blindness and death from drinking Jamaica ginger, ess. peppermint, etc."

7. In Virginia Medical Semi-Monthly, January 25, 1901, Journal A. M. A., Dr. John Dunn reports two cases of amblyopia following the use of Jamaica ginger.

8. American Medicine December 21, 1901, page 995, expert testimony by Dr. H. V. Wurdemann of Milwaukee showing blindness from inhalation and ingestion by mouth of methyl alcohol. After reporting a number of cases he concludes by saying "from the foregoing it seems that it (wood alcohol) will produce blindness of a characteristic type which is sudden and in most cases complete."

9. In the Therapeutic Gazette, Detroit, December 15, 1901, (Journal A. M. A.,) Dr. Swan M. Burnett reports several cases of methyl alcohol poisoning and classes it as a "dangerous poison" and suggests that its use should be prevented. He says in part that "the country is flooded with a poison dangerous to vision and life itself under various and unsuspected forms in the use of wood alcohol."

10. In a paper entitled "Blindness from drinking bay rum, etc.," read by Dr. H. Moulton, of Ft. Smith, Ark., before the 52d Meeting of the American Medical Association. (Journal A. M. A., November 30, 1901, page 1447.) Dr. Moulton says in part "those who record cases of blindness due to this cause mention in all thirty persons who drank from one to two drams to an ounce or more of the substance and were made sick by it. Fifteen or fifty per cent lost their sight. An analysis of fifteen cases of wood alcohol blindness and an analysis of twelve cases of blindness due to Jamaica ginger, etc., shows the striking identity of important symptoms." He then gives the classical clinical picture of methyl alcohol poisoning and

gives numerous references which may be found in *Journal A. M. A.*, vol. XXXVII, pages 1448, 1449. In the discussion Dr. Hiram Woods of Baltimore said: "there can be no question in regard to the identity of symptoms in the Jamaica ginger, bay rum and methyl alcohol cases. I am not familiar with any form of blindness which gives the clinical features that all these cases show." The identity of the symptoms was concurred in by Drs. A. B. Hale and Casey A. Wood of Chicago, Dr. Edward Jackson of Denver and Dr. R. W. Miller of Los Angeles.

11. A reprint, sent to me by Dr. Reid Hunt of Baltimore, from the *Johns Hopkins Hospital Bulletin*, (August and September, 1902,) gives the results of a series of twenty-eight experiments made by him with methyl alcohol or Columbian Spirits, and with ethyl alcohol. From his experiments he deduces the following:

"The symptoms of intoxication by wood alcohol are produced more slowly than by grain alcohol and the period of intoxication is more prolonged. The effects of a single dose of methyl alcohol are long continued and it is an especially dangerous substance to give for any length of time. While ethyl alcohol could be given to animals in doses sufficient to cause intoxication for months or even for almost a year without causing marked anatomical or functional disturbances, methyl alcohol given in small doses every other day was tolerated for but a few weeks. The animals remained comatose for days, did not eat and died although the administration was discontinued."

"The highly important discovery has been made that methyl alcohol differs markedly from ethyl alcohol in that it is but partially oxidized in the body and that its administration leads to the formation within the body of a markedly poisonous acid (formic acid). After its administration to an animal or a man a considerable amount of formic acid can always be found in the urine. Formic acid is excreted very slowly. This is probably the cause of blindness which so frequently follows methyl alcohol poisoning in man. Highly differentiated nerve structures

are especially likely to suffer when exposed to the action of a poison for a long time."

Dr. Hunt's conclusions are that "however pure the preparation (methyl alcohol) may be, it is totally unfit as a substitution for grain alcohol in any preparation which is to be taken internally and especially in a preparation which is to be taken for any length of time."

Dr. Hunt also states that there is no material difference in the action of the purified and of the crude methyl alcohol.

It is interesting to note the difference in the results of experiments of Birch-Hirschfeld with methyl alcohol and those of Dr. de Schweinitz with grain alcohol upon monkeys. (Dr. Hunt's report.) Birch-Hirschfeld describes experiments with methyl alcohol upon three monkeys. Small doses were given every one or two days. When it became evident that the animals were on the point of death they were killed in order that the eyes and optic nerves could be obtained in good condition. The first was in a dying condition on the eighth day; the second on the fifteenth day and the third on the eleventh day. Two monkeys had marked degenerative changes in the retina and one was totally blind.

In Dr. de Schweinitz's experiment he gave a small monkey 3.75 c. cm. of a 95 per cent grain alcohol for six months. At times as much as 7.5 c. cm. of alcohol was given every day for several days. The animal was repeatedly very drunk. No disturbance of vision could be made out. The animal was finally killed. No degenerative or inflammatory changes were found in the eyes or optic nerves.

12. E. G. Hoitt of Marlboro, Mass., reports (*Boston Med. & Surg. Jour.*, Jan. 15, 1903, p. 62) a case where a family of six drank a quantity of wood alcohol. The father, two daughters and grand-son died in a few hours. The mother was ill a long time and died, one son survived by vomiting the substance.

13. S. W. Abbott of Newton, Mass., reports (*Boston Med. & Surg. Jour.*, Jan. 15, 1903), a case where three men drank a quantity of "Colonial Spirits" at Beverly,

Mass., and all of them died soon afterward. He further states that an analysis of this substance showed that it was wood alcohol and said that the same article was being sold under different names, that deaths of this character was on the increase and that "some sort of legislation seems necessary to prevent their occurrence." In the discussion Dr. Abbott states that "it seems to me there is something in the specific nature of wood alcohol that is more poisonous than the degree of poison—something more specific than the degree of poison." Dr. Abbott is probably not aware of the formation of formic acid in the body from the ingestion of methyl alcohol.

14. A. E. Paine (same journal) reports two deaths from drinking wood alcohol at Avon, Mass., and mentioned the fact that the inhalation of its vapor produced cystitis.

B. H. Hartwell, A. W. Buck and Dr. Mead also report (same journal) deaths from drinking wood alcohol and Dr. Buck mentioned the fact that his patient went blind before death.

I have by no means exhausted the literature proving the toxicity of methyl alcohol for our journals frequently report blindness and death explainable and unexplainable which are clearly due to methyl alcohol. Some damage suits are now pending against manufacturers of Jamaica ginger, etc., for alleged poisoning but so far as I am aware none have succeeded in securing damages. In one suit that was brought in February, 1903, the jury stood nine for conviction and three for acquittal.

There can be no doubt that methyl alcohol is used extensively in the manufacture of our culinary and medicinal extracts, spts. ess. etc. I have obtained abundant evidence of this. In addition to the evidence I have given in these reports I have received a number of letters like the following personal communication from Sutliff & Case Co., Pharmacists, Peoria, Ill.:

"We know many instances where spirits, tinctures and other alcoholic preparations are sold for less than the cost of alcohol they were supposed to contain. Some druggists and also manufacturers buy large

quantities of deod. wood alcohol. Representatives of the manufactures of deod. wood alcohol (Columbian Spts. etc.), inform consumers that their alcohol may be used internally and is not poisonous—that the poisonous properties are due to impurities, chiefly acetone."

This last statement is proved to be false by Dr. Hunt and others.

Personal communication from Parke, Davis & Co., Detroit, Mich.:

"An analysis of some of the fluid extracts of competitors in our laboratories disclose the fact that they were made with methyl alcohol. Experiments were made for our private information."

The Bulletin of Pharmacy (Detroit) March, 1903, p. 93, reports the investigations of the health department of New York City. Of 215 samples of spts. camphor secured, forty were made from methyl alcohol. Some of these samples were secured from members of the Pharmaceutical Assn.

Similar reports are found from health boards at Washington and New Orleans—reports of substitution and in the same journal are reported five deaths from substitution, in drug stores, of methyl alcohol for ethyl alcohol. Three of these deaths are reported from Albany, N. Y., and two from Columbus, Ind.

How many unreported deaths occur we may never know, but I frequently see notices of disastrous results in Meyer Bros., Druggist (St. Louis) and Merck's Report.

The reports are so numerous that it is useless to enter into the bibliography. In fact in many cases little effort seems to be made to conceal its use.

A review of this paper will show:

1. That methyl alcohol is an active and dangerous poison;

2. That it is used extensively in extracts, spirits and medicines etc., intended for internal use and that its use is not suspected by the consumer;

3. That it is capable of producing, and has produced in numerous instances, death and permanent blindness even when given in small quantities. (Burnett drachme iss, Raub drachme ii-v.)

If, in the face of the argument presented to us daily, anyone should deny its toxicity we may certainly be justified in considering him beyond the reach of argument.

The use of methyl alcohol has proved lucrative and so long as that is so it will be used extensively. A series of what are called facts are brought to prove its harmlessness but the cases of blindness and death give them the lie.

I will close with these suggestions to our Pure Food Commission:

1. To require every manufacturer of food packages to publish on the package the formula of the contents as is done in England.

2. To prosecute everyone failing to do so.

3. To recommend a federal tax on methyl alcohol so that its substitution for grain alcohol would not be profitable.

Our State Board of Health should require the same from our drug manufacturers.

I desire to express my appreciation of the excellent index of the Journal of the American Medical Assn. It surpasses any medical index with which I am familiar and I would have been unable to secure most of this information without its use.

Discussion.

Dr. Matthews: I would like to ask the doctor if in these bathing mixtures methyl alcohol is advisable? I know father and I prescribe alcohol in bathing mixtures, and the question is, if the substitution is made, is there any danger?

Dr. Main: I would answer that question by saying that I have had no personal experience with wood alcohol as used in the bath for alcohol rubbing, but I saw a report from Los Angeles, Cal., of a nurse who had used wood alcohol for rubbing in the bath after a case of typhoid fever, and the patient went blind.

E. H. Oshner: This paper seems to be an extremely timely one. If every doctor has had as much trouble as I have I think it should be barred from all use. I have seen a case of total blindness from wood alcohol in my own practice, and one of partial atrophy. In one case the total blindness resulted from the patient burning out large beer casks with wood alcohol. It was his business in the brewery to fumigate large beer vats with wood alcohol, and he became blind. This case I saw two years ago, and I studied the case very thoroughly, and finally concluded that it must be wood alcohol that acted as a poison in his case. I had not seen the report of any case at the time. I immediately sent him to one of our best oculists

in the city, with a note requesting the doctor to ask no questions of the patient, but to examine him and tell me what the cause of the degeneration was. He called me up on the telephone on the following day and told me that nothing but some poison could cause the appearances he found. I took this precaution because I wanted an unprejudiced opinion, I did not want the oculist to get the history, and from that derive his opinion, because I had questioned the patient very carefully. Shortly after that I saw a case of a man who was employed in a varnish factory, but had become totally blind in just exactly the same way. On careful inquiry I discovered that they had been using wood alcohol in their varnish. A third patient came from the same shop, and showed symptoms of chronic poisoning, with a slight change of the optic nerves. I immediately sent him out of the business, and so far as I know he has had no further trouble. I also saw one case where there seemed to be some trouble from the use of wood alcohol in the bath. That was, however, rather indistinct, and would not be of any special value.

I certainly think that the medical profession should take some steps to prevent the use of wood alcohol in any way, whether it is used internally, or in any pursuit where the patient must be exposed for a long time to the fumes of wood alcohol, such as varnish factories, where workmen have to work for many hours in places where they are exposed to the fumes.

Dr. Gehrman: I think this subject is important enough to warrant this Section going on record in regard to it, and I would therefore propose the following resolution, which I offer for your consideration:

In view of the fact that we recognize the poisonous effect of methyl alcohol, when used internally and externally, be it resolved by Section 3, of the State Medical Society, that the State Food and Drug Commissions be urged to take action to prevent its use in all pharmaceutical and culinary preparations as a substitute for alcohol, and that where it is used in the arts special precaution be taken to protect workmen from its effect.

The resolution was duly seconded. Carried.

RADIO-THERAPY, WITH REPORT OF ELEVEN CASES.*

BY CHAS. D. CENTER, M. D., QUINCY.

The object of this paper at the present time is not to belittle, or try to belittle, radio-therapy, nor to magnify, or try to magnify the same. It is not supposed that the results recorded here will prove anything conclusively in the X-Ray world. Nor do I wish to seem to lay down hard and fast laws to be accepted by any other. The object in view is to add to the list of cases treated by X-Ray

*Read at 53d Annual Meeting, Chicago, May 30, 1903