nation of the mucus which was found to contain iodine, and demonstrated its existence down to the openings of the smaller bronchial tubes.

This experiment positively demonstrated that the starch test solution was colored by iodine to the mouths of the smaller bronchial tubes. There was no evidence of iodine to be found in the pulmonary alveoli.

On August 16, I secured a dog, weighing some twelve pounds, and placed him in a box of the following dimensions: Twenty-seven and three-quarter inches long, eighteen and three-quarter inches high and twelve inches wide, inside measurement. This would make the capacity of the box equal to 6,243 $\frac{3}{4}$ cubic inches. A one-quarter inch opening was made in the middle of the top of the box for the entrance of vapor, and a one-half inch opening two inches from the bottom of each end of the box for the exit of vapors. For fifteen minutes a vapor consisting of a solution of equal parts of blandin and a saturated solution of starch was vaporized continuously in the box. During the whole progress of this experiment the dog remained very passive and quiet in the box without the slightest resistance, and in fact appeared to rather enjoy what must have been to him a novel proceeding. At the end of fifteen minutes the dog was removed, and as there was found no evidences of starch upon the air passages easy of inspection without killing the dog, it was concluded that the starch had not penetrated any considerable distance, and hence a new vaporized solution consisting of 20 per cent. solution of iodine in blandin was substituted in the vaporizer. This same dog was allowed to remain in the box twenty-three minutes, at the end of which time he was killed with a 20 per cent. solution of the cyanide of potassium introduced per rectum, 6 drachms of the solution being required to produce death, which occurred in three minutes. Upon removing the air passages, the starch test failed to show the presence of iodine anywhere except in the mouth. Also a microscopic examination of the air passages failed in showing the evidences of any penetration of the iodine. I was assisted in this experiment by Dr. C. D. Wescott and Dr. Adolph Gehrmann.

I am unable to explain the failure of this test to demonstrate the existence of the vaporized inhalant in the air passages, and I believe both Dr. Wescott and Dr. Gehrmann were equally at a loss to understand its failure, as the conditions under which the test was made appeared to be favorable for a successful demonstration. Possibly the inertness of the animal used had something to do with it, as he appeared to make no effort at deep breathing whatever.

In conclusion, it seems to me as a result of quite an extensive experience in the use of vaporized inhalants among patients, as well as in the light of the experiments upon animals quoted, that we are justified in claiming that it is possible for vaporized medicaments to penetrate the air passages as far down as the openings of the mouths of the minute bronchial tubes, and that we may reasonably expect in cases where the inhalants are used that the benefit to be derived is in proportion to the therapeutic relation that the vaporized medicaments bear to the diseased condition. I have purposely avoided any suggestions as to the use of any particular combination of drugs to be used for any given condition in the inhaler. In a general way, I would advise the selection of such combinations as are but slightly irritat-

ing to the air passages to begin with, and then as the patients become more tolerant to the action of the medicaments their strength can be increased as necessary. I have thought that in cases of pulmonary tuberculosis considerable benefit was derived by the inhalation of a 1 to 3 per cent. solution of beechwood creasote, used in solution with some neutral oil, as blandin or albolene.

The paper, as presented, I hope to be but a preliminary one to a series of more extended and extensive experiments, which will have for their purpose the demonstration of the extent and permanency to which vaporized inhalants may penetrate the air passages.

DISCUSSION.

DR. E. FLETCHER INGALLS said that experiments showed that the vapor occasionally penetrates to the larger bronchial tubes, in rare instances to the finer tubes, and in the rarest instances to the smallest tubes. The topical treatment in diseases of the air passages must be confined largely to the larynx and trachea, and perhaps to some extent to the bronchial tubes. The suggestion that the remedy should be non-irritating is very important for physicians who desired to medicate patients in this way. Some benefit might be derived from the inhalation of the vapor in tuberculosis. The instrument exhibited was an excellent one, but there was a possibility of the tubes becoming clogged. This was largely true of all other instruments that had been invented.

DR. MOREAU R. BROWN had the pleasure of seeing some experiments made on dogs and other animals similar to those reported by the essayist, and the results were that the vapor did not penetrate very deeply into the bronchi. He was inclined to believe that in the human subject we can get a solution deeper into the air passages than in animals, because in man there was the power of deep inhalation and the attempt to draw the solution deep into the air passages. The ipecac treatment penetrated well into the tubes. He thought iodoform dissolved in either, deeply inhaled, would penetrate further than an iodine solution, if carried in by the globe inhaler. The only objection to the instrument exhibited was that it does not properly vaporize watery or oily solutions. This could be accomplished by the globe nebulizer.

DR. WILLIAM E. CASSELBERRY directed attention to the proper position of the head and tongue when an attempt is made to give a spray for inhalation into the air passages. This might explain the diversity in the results obtained from the numerous remedies used. Some penetrate deeply, while others did not. He was satisfied that the spray could be made to penetrate a considerable distance into the bronchial tract.

DR. NORVAL H. PIERCE directed attention to the closure of the nose. If a tube is inserted in the mouth and the patient told to breathe through it, he used the nose instead; therefore in the use of any inhaler the nose should be closed and respiration carried on through the tube. He had used the globe atomizer in forcing vapor into the middle ear in a case of otitis media, after having performed paracentesis, and there was no doubt but that the vapor had penetrated the middle ear.

THE TEETH OF OUR SCHOOL CHILDREN; WHAT CAN BE DONE TO SAVE THEM?

Read in the Section on Dental and Oral Surgery, at the Forty-fifth Annual Meeting of the American Medical Association held at San Francisco, June 5-8, 1894.

BY J. C. MCCOY, M.D.

SANTA ANA, CAL.

No doubt this question has been asked by every intelligent practitioner, as day by day he looks into the oral cavities of Young America, seeing there the almost universal dissolution of the masticatory organs. Those who live in small cities or towns and practice for all classes of society, have a better opportunity to know the condition of the teeth of the masses than does our city brother with his aristocratic patients.

A large majority of the people can not pay for

skilful operations, and their teeth must be saved in an inexpensive manner or be gradually lost before middle age, to be replaced by miserably fitting rubber dentures, with the accompanying shrunken alveola and uvula-like appendages called gums, condemned to worry through the remainder of their earthly existence feeling that nature did a poor job on their masticatory organs, or they would have lasted till old age, irrespective of ignorance and neglect from their earliest childhood. Ignorance and neglect go hand in hand, and are the cause of more diseases and of the loss of more teeth than all other causes combined.

For the past ten years my practice has been in a community that numbers among its citizens many persons of culture and refinement. Others whose exterior apportionments of life are all that could be desired, and whose children are being trained in all the arts and sciences of the day except that of cleanliness of the mouth. We have thousands of this class. I have examined and worked for hundreds of them in the past ten years. The ignorance on the part of the parents, and neglect on the part of the children who know better, is one of the wonders of the nineteenth century.

In one school of 700 pupils, 500 from 10 to 18 years of age, I distributed printed slips with the following questions: Do you cleanse your teeth with a brush every day? Do you cleanse your teeth with a brush twice a day? The teachers requested the pupils to answer the questions by writing the word yes, or no, to each question. The slips were immediately gathered up. On summing up it was ascertained that out of 500 pupils, 50 cleaned their teeth twice a day; 275 used a brush sometimes; while 175 did not own a brush. Notice, the ages were from 10 to 18. In the primary department of 200 pupils, from 6 to 10 years of age, the teachers said they did not think there were 10 children in the department who used a toothbrush.

This school is not an exceptional one in this matter, as further inquiry and investigation demonstrated. In fact its graduates take high rank at our universities, and if there is any difference, it is in advance of most schools in percentage of those who have clean mouths, as well as neat clothes and bright faces.

When there is so much neglect, and so little real care of the mouth, it is not at all strange that the sixth year molars have to be sacrificed daily, because the parents can not go to the expense of treatment to have them preserved, thinking all the time that this most valuable tooth is deciduous, and soon to be replaced by one that is bacteria proof and will last forever, in a mouth that has never been properly cleaned.

The school of 700 pupils mentioned, where only 50 made any pretense to regularly care for the teeth, shows what a field for instruction and training every teacher has. What an opportunity for philanthropy and missionary work!

Our children's teeth must be saved. Experience has taught us that it is impossible to repair the ravages of decay, except in a limited degree. Prevention through cleanliness and proper care of the teeth is the only way possible and practicable, to limit the wholesale destruction. Yes, I say limit, for even when ordinary care is used there is still room for the work of the skilful dentist.

The question before us is, What can we do to save the teeth of our school children?

American dentistry leads the world to-day, and the world justly honors us for the great advances we have made in the preservation of teeth; but the fact still confronts us that millions of teeth are annually lost in America, that need not have been sacrificed if proper care and cleanliness of the mouth had been begun in childhood and continued to manhood and womanhood.

The dentists of America, a noble and philanthropic band of 20,000, have done much to educate and train our citizens in the care of their teeth. We must do more. And at the same time in order to multiply our usefulness, we must solicit the aid of our public school teachers. With their coöperation we can reach and train millions of children.

A majority of the children of our land are in our public schools. They are under the teacher's instructions from 5 to 17 years of age. If the teachers were required to instruct and train the children in the proper care of their teeth, and to insist upon their carrying out such instructions practically at home, we would have accomplished—or at least begun—a great work. If such pupils could be trained from infancy up through all the grades to the high school, I am very sure we would see men and women with better teeth than the average American of to-day. The teachers are the only ones who can do this work. The parents of a large per cent. of the pupils are ignorant and careless almost beyond belief, and their children will follow in their footsteps, unless we dentists of America come to the rescue.

How can we bring this matter prominently before the educators of our land and secure their hearty coöperation?

I hope this ASSOCIATION will pass resolutions on the subject, indorsing the plan, and by its sanction give prominence to its importance.

Let the dental and medical press advocate it. Let each State dental association not only pass resolutions on the subject, but appoint a competent committee to arrange a manual on the subject of the care of the teeth. Let the same committee induce the State board of education to adopt such manual as a text-book to be used by teachers, and taught in our normal schools, requiring teachers to be able to pass an examination upon the contents of such manual, and then require them to carry out such instructions in their respective schools. May each one of us constitute ourselves into a special committee, to see that the spirit of this paper is carried out practically in the schools of our neighborhood.

It is not necessary for me to give more than a few hints on the subject to this body of intelligent dentists before whom I have the honor to speak. I hope to gain not only your hearty approval to this plan, but your enthusiastic coöperation, so that inside of twelve months every public school in our broad land will have begun the much needed reform of cleanliness of the teeth and mouth. So that in the future examinations of schools on the subject of oral hygiene, instead of there being only 50 out of 700 who clean their teeth regularly, we will not find 50 careless ones in 1,000.

This is a great work. We alone can do it. Let each one of us resolve to do our full share and prove ourselves philanthropists to the rising generation.