The later affections include lessened bowel activity, meteorism, albuminuria, icterus, incontinence and retention of urine, bloody urine, arterial rigor or spasm of arterioles, acute edema of joints; various eye symptoms, as blindness (from excess of ultraviolet rays), conjunctivitis, iritis, cataract, dislocation of lens; ear symptoms, as rupture of tympanic membrane, deafness, bleeding; thermal changes—rise of temperature to 38 or 39 C. (100.5-102.4 F.), amnesia, neuritis, epistaxis, etc. The most characteristic appearance of an electric burn is an ashy-gray spot or lesion, without an area of inflammation, an area of edema, and the slough which follows considerably beyond the limits of the burn, due probably to the coagulation of cells by heat not sufficiently intense to cook them.

TREATMENT

The treatment is divided into the immediate or first aid, subsequent, and the later. The immediate treatment demands that the victim be taken out of the circuit. This is accomplished by the use of a dry wooden pole or rope, even one made of twisted clothing, this being used to drag him forcibly away from the live wire. Properly insulated pliers may be used to cut the wire. The *Scientific American*¹⁰ makes the statement that chemical fire extinguishers were found to be dangerous in the hands of rescuers when the stream is played on a live wire. Instances are numerous in which one workman or a spectator has also been electrocuted while attempting to rescue one still in contact with the wire. The immediate shock may vary from a disagreeable sensation to loss of consciousness and death. There may be sufficient shock to cause a violent contraction or expelling with loss of consciousness which may last from a few minutes to a few hours, often with convulsions and death, or it may only cause faintness for a few minutes, vomiting, the subject being all right after a few hours.

When there is any disturbance of respiration, artificial respiration, about eighteen times a minute, is employed, the patient's head being raised and tongue out, care being taken not to make pressure on the region of the stomach, lest its contents be forced into the larynx. Crile says:

After seven or ten minutes chances for recovery are poor. Circulation and respiration may be reestablished, but consciousness is not regained because after that length of time of cerebral anemia, brain recovery is poor.

Wounds should be dressed temporarily to keep clean and the patient removed to a hospital. If wounds have been infected, wet dressings are indicated; if not, dry dressings. Shock is treated as usual. De Tarnowsky considers electric wounds sterile, McGowan of the Edison Commonwealth Company does not. De Tarnowsky uses dry dressings in all cases which he knows are clean; McGowan uses wet on all.

Both obtain good results. Edson says that it takes one and a half to three times longer to heal electric wounds than common burns.

REPORT OF CASES

CASE 1.—On Oct. 26, 1908, the patient, W. L., aged 34, received 2,200 volts alternating current while working on the ground, on his knees, without gloves. The resistance there was practically nil. Just how long he remained in contact is not known; when fellow workmen reached him he was in contact with the live wire and seemed lifeless. The line men, remembering their instructions, withdrew him from the current as quickly as possible, in this instance knocking him loose with a wooden box. After a few minutes of coma, a condition

of wild delirium supervened in which condition I found him. The following injuries were found: 1. At hair line over right eye, deep wound 1½ inches long by 1 inch wide, down to and including the skull, leaving a black streak on periosteum ¾ by ¼ inch wide. 2. Right hand: palmar surface and middle phalanges of fourth finger received deep burns. Thenar eminence burned deeply, to but not including the tendon of the flexor longus pollicis. 3. Left hand: superficial burns on ulnar and thenar eminences. Tip of left thumb, outer side: half of nail and bone burned. 4. Median line over lower portion of sternum: superficial circular burn 3 inches in diameter. 5. Tip of right ear broken. 6. A small burn ½ inch in diameter on occipital portion of scalp. The burns on the forehead presented an ashy gray appearance without an area of inflammation, but with considerable edema. This area extended downward from the skull, though more superficially, to the line of the eyebrow. The patient was anesthetized and the wounds cleansed with 1 to 5,000 bichlorid, dried, touched with tincture of iodine and dry dressed. The following day wet boric dressings were applied. Sloughs were removed as fast as they became detached in the next two weeks. On all sides, all wounds sloughed so that their greatest diameter was two and three times the original size.

On Nov. 16, 1908, at the Evanston Hospital, with the assistance of Dr. Parks and Dr. East, skin was transplanted from the thigh onto all the wounds. The skull-wound, with its periosteum gone, showed little inclination to cover over by itself, so it was left uncovered.

On April 7, 1909, Dr. Danforth, Dr. East and I operated again at Evanston Hospital, this time doing a plastic operation on the skull, cutting away the V-shaped scar tissue above and below the wound. At this juncture we found that the outer table of the skull was practically loose. It was chiselled free and its bed curetted. Then, by deep mattress sutures, all was covered. Recovery was uneventful except for a small stitch abscess. The result was satisfactory. The patient has, since June 1, been back to work after seven months' absence. Slight deafness and slight deformity of right hand are the only permanent sequelæ.

CASE 2.—G. K., aged 22, while standing on a ladder painting a pole, received 10,000 volts alternating current, Feb. 6, 1909. The current ran up his left arm, inflicting six superficial wounds, from his elbow to his thumb. When he was shocked, he jumped or fell from the ladder, breaking contact and saving his life. Uneventful recovery in three months.

CASE 3.—A workman (Aug. 27, 1909) fell fifteen feet from a pole after he had ascended it, "to see if he could see anything to do for the burning transformer." The shock of electricity caused a small burn on the right arm. The interesting point in this case is that the patient simultaneously had hemorrhages into the scleræ, stomach and intestines. Recovery was uneventful and complete except for a weakness in the back from the fall.

520 Davis Street.

ORAL PROPHYLAXIS *

ALPHONSO IRWIN, D.D.S.

CAMDEN, N. J.

AIM OF PROPHYLAXIS

The aim of the prophylactist is to obtain an immune condition of the mouth. The purpose of operating, the object of manipulation, the end of treatment is to produce immunity from disease. Surgeons and dentists are a unit on this point. It is a universal ideal for which we are striving.

But we differ in regard to the selection of instruments, the art of operating, and the methods of surgical treatment. Let each man choose for himself the means by which he can accomplish the best results. The sub-

* Read in the Section on Stomatology of the American Medical Association, at the Sixtieth Annual Session, at Atlantic City, June, 1909.

10. *Scient. Am.*, March 20, 1909.

ject has been presented in the ablest manner possible, in all of its phases, before the societies and in the journals. I leave the consideration of prophylaxis in relation to surgery to the oral surgeon.

"The prevention of disease by operations performed with instruments on the mouth" is the clinical definition of oral prophylaxis. It is not my purpose to detail the processes by which an immune condition of the mouth is established; that would take me outside of the art and bring us into the science treating of bacteria, germicides, asepsis, hygiene and sanitation. But, in passing, I would observe that, inasmuch as oral asepsis is transient (for bacteria are back again multiplying, half an hour after we sterilize the mouth), surgical cleanliness, supplemented by personal cleanliness, is all the more imperative. Cleanliness by personal effort is attainable, and this state of oral cleanliness is urgently needed by the public. Our clientele are well cared for, but it is doubtful if 75 per cent. of the population of the United States practice the simplest precaution in oral prophylaxis, i. e., use a tooth-brush. My object, therefore, is to make a practical application of oral prophylaxis to the needs of the public. This calls for some consideration of the subject as a humanitarian principle.

PROPHYLAXIS AS A HUMANITARIAN PRINCIPLE

Oral prophylaxis, considered as a humanitarian principle, is the practical application of knowledge and skill for the benefit of mankind. No man should live for himself alone. He owes something to his neighbor. Oral prophylaxis is one branch of dentistry that can be universally applied for the benefit of the public. The intelligent dissemination of the practice of oral prophylaxis among the public is incumbent on the practitioner. When we consider that in the United States alone there are 30,000,000 persons of teachable age, we have a task that must tax the abilities of the most ambitious portion of the 40,000 dentists who should grapple with the problem, in this country. If we should venture to enlarge the crusade and take in the 1,600,000,000 people who inhabit the earth, we could estimate that at least 500,000,000 people of teachable age should be taught to take care of the mouth. I challenge anyone to prove that even 10 per cent. of this number take any care of their mouth. I leave the solution of this vast problem to dentists imbued with the spirit of Livingston, the endurance of Stanley, the energy of Roosevelt. It is exceedingly doubtful if one-third of the 20,000,000 children in our schools take any care of the mouth whatever. It is through the public schools that we must hope to inculcate the principles of oral prophylaxis. The minds of the pupils between 5 and 17 years old are receptive and appreciative of the truth. The physical destiny of the child is determined by the seventeenth year, so that the habit of prophylaxis should be indelibly instilled in its mind during this period. It is through the children that we must enlighten the public and establish a habit of preserving the mouth and teeth. Attempts are being made to impress on the minds of children the value of oral prophylaxis, but a concerted, united, universal movement is needed in order to achieve results. The strategic value to the professions alone, gained by securing the confidence and cooperation of the children, is reward well worth striving for, even if there is no monetary compensation. The boy of to-day is the man of the morrow; the girl of to-day is the mother of the future. Therefore give us the public school children of America and we will enforce sanitation; avert epidemics; starve pestilence; produce a nation of thinkers

and workers, possessing sound minds in robust bodies, instead of a race of toothless drones, dyspeptics, hypochondriacs, prospective lunatics and degenerates. Give us the school children and we will solve the most intricate problem in oral economics, establish the cause of practical oral prophylaxis in the minds of the American public forever; popularize dentistry so that it will reach a degree of usefulness hitherto undreamed of, and elevate surgery to the highest pinnacle of fame in the estimation of the public.

Prof. Charles W. Eliot, of Harvard University, has well said: "The subject of the care of the children's teeth in the public school is only a part of the general forward movement which should enlist every force of society, private and public, for behind it lies the movement of the whole people for improved government, preventive medicine and improved facilities and conditions of labor."

Believing this statement to be correct, I conclude that the basic proposition is that oral prophylaxis is an economic problem in the school room demanding immediate solution.

PROPHYLAXIS AS AN ECONOMIC PROBLEM IN THE SCHOOL ROOM

The mouth may become the "gateway of evil." Through this "gateway" myriads of germs may pass back and forth into the alimentary canal whence they can infect the human body; while by the reversal of the process the mouth may be infected by germs from distant diseased organs. From 1,500 to 14,000 pathogenic bacteria are inspired every hour by healthy persons.

Dr. S. E. Tracey has recently called attention to the importance of oral prophylaxis to the abdominal surgeon in preventing pneumonia after anesthesia, and septic infection, after operation on the abdomen. Medical and dental journals contain frequent references to these points, and the testimony is both ample and conclusive from the practitioner, from the press and from the bacteriologist.

Therefore the statement that every time a diseased person breathes, coughs, hawks, sneezes, or spits, he sets in motion ever-widening vibrations of bacteria-infected air, is of peculiarly sinister import in reference to the school room. The school may become a menace to the health of the commonwealth. Epidemics may originate from oral infection. The commonwealth faces an economic problem in prophylaxis. It is cheaper to prevent disease than it is to treat it. It is easier to preserve children from suffering than it is to cure them. You would rather save your own children from suffering than have a chance to display your skill as a surgeon. Why not save them from loss of time, loss of education, loss of service, loss of health, possibly death?

If we attempt to solve this economic problem as a world-wide proposition, we are appalled by the magnitude of the task, but if each dentist will handle the problem as it lies at his door, namely, in the nearest public school, the solution is easy. The avenue through which we must get into touch with the public is the introduction of oral prophylaxis into our schools. Accustom the children to the sight and skilful use of surgical and dental instruments so that confidence and desire for oral care will supplant terror and aversion to mouth surgery. Enlist the public school children of this country in the crusade for oral prophylaxis; by advocating it assist in the work, and you have solved the problem.

ORAL PROPHYLAXIS IN RELATION TO SCHOOL DENTISTRY

Oral prophylaxis is being urged in the public schools throughout New Jersey, New York, Massachusetts, Michigan, Pennsylvania, and other states. Its introduction is advocated wherever an opportunity occurs. In some cities the movement is meeting with success. I will summarize some of the recent work accomplished in the East.

Dr. J. Wagner states that in Elizabeth, N. J., among the 1,000 pupils examined, 76 per cent. had defective teeth. "If there were some means of inducing every child to use a tooth-brush and powder, at least in the morning, fully 50 per cent. of the carious teeth would not exist."

The mouths of 1,525 school children in Ann Arbor, Mich., have been examined by Dr. Russel W. Bunting. He finds in pupils from 5 to 17 years of age 2,068 carious teeth, 142 cases of malocclusion, 3 cases of Hutchinson teeth, and 7 high V-shaped arches.

In Butler, Pa., out of 1,015 children examined, 994 had teeth needing immediate attention and 325 had never visited a dentist. In Erie, Pa., 1,271 children needed attention out of 1,411 examined. Dr. W. F. Harrer examined 247 pupils in the public schools. About 3 per cent. used the tooth-brush daily; 1,699 teeth were defective; 29 had putrescent roots. Sordes and congested gums were marked.

In New York City, with its 800,000 children of school age, and an enrolment of 630,000 pupils, there is but one school dental clinic established, and that in connection with an industrial school. Dr. H. L. Wheeler, head of the clinic, states less than 10 per cent. of the children of the city receive dental care; about 75 per cent. of the New York school children have never been inside of a dentist's office. Rochester led the movement in this country in 1905 by establishing free dental school clinics.

In Brookline, Mass., out of 1,284 children examined, 63 (12.5 per cent.) were rated as good, 428 (33 1/3 per cent.) as fair or bad. Boston has a population of over 100,000 school children. It is estimated that 75 per cent. (75,000) need dental treatment. Dr. David S. Scannell, a member of the Boston School Board, declares that the college clinics, hospitals and dispensaries are unable to provide dental treatment for these children. He admits the need, deplors the condition, and excuses the school board on account of lack of funds. Boston and hundreds of other cities are put to shame by the little city of Strasburg, with its \$60,000 building devoted to the prevention of human suffering by free dental treatment of public school children. It is not lack of dollars, but lack of sense; it is not lack of interest by the practitioner, but it is lack of consent and cooperation bestowed by the authorities, that retards the introduction of oral prophylaxis by dentists for the benefit of the public school children. If these were freely accorded, ways and means of defraying the cost would soon be found in this country.

Mexico has established free dental school clinics.

The effort to introduce oral prophylaxis is more advanced abroad than at home. "The treatment of children's teeth in public schools is a subject of live interest in Europe and engaging the attention of the chief cities." The Second International Congress on School Hygiene, held in London, at which 2,000 delegates from all parts of the world took part, with the treatment of children's teeth in public schools as the chief topic, is proof of this interest.

School dentistry has been considered of such vast importance that it has already been adopted by thirty-

three of the chief cities of Germany and fifteen cities of other countries. Oral prophylaxis has reached a high state of development and usefulness in Germany. Mülhausen, Darmstadt, and Strasburg possess model school clinics.

In 1902 a dental clinic was established in Strasburg which is now maintained by the state and operated for the benefit of children of school age. "This establishment has for its object the sanitation of the mouth in the young, accustoming the children and parents to a rational care of the teeth, thereby elevating the general health of the people at a modest expense." The results have proved that, although dental treatment is one of the most important factors in maintaining good health, no other institution can be worked so successfully at such a small expense. In five years' work in Strasburg and suburbs, 90,017 children, altogether, from the elementary and intermediate schools, received free treatment. The feasibility of this scheme should appeal to municipal and state authorities when the amazing results are shown that the average cost of examinations and extractions was but seven cents each, and the average cost of treatment and fillings less than twenty-five cents each. In Strasburg the municipal government has authorized the erection of a building for the dental treatment of school children, at a cost of \$60,000 (Report of Professor Jessen).

In Great Britain, Dr. William Fisk, Secretary of the School Dentists' Society of England (founded in 1898), informs me that the dentists appointed at a fixed salary per annum to take charge of the pupils' teeth can do their work to the best advantage to themselves and their charges in the poor law schools of Great Britain. The poor law and destitute children are well looked after with the sanction and approval of the local government board. The vast elementary school population, representing the working classes, numbering about six millions, have nothing done for them. In many instances, dentists do the necessary work in benevolent institutions supported by the public schools of England.

In 1900, at the Third International Dental Congress in Paris, Dr. Elof Forberg, of Stockholm, announced the results of the examinations of 16,000 public school children in Sweden. Professor Limberg, of St. Petersburg, Russia, found that 95 per cent. of children's teeth decayed between 5 and 16 years of age.

The importance of oral prophylaxis was discussed at St. Louis by the Fourth International Dental Congress, and it has been kept before the profession by the many national organizations since, notably in Austria, Belgium, Denmark, France, Germany, Great Britain, Italy, Japan, Mexico, Russia, Sweden, Switzerland, United States. The boards of dental examiners in the United States now ask from three to five questions on oral prophylaxis in examining candidates for a license to practice dentistry, in accordance with the agreement reached with the National Association of Dental Examiners in 1907. The efforts of these organized representatives of the general practitioner of dentistry, as well as the educational institutions of the civilized world, are causing the movement to take more definite shape and enlist the active cooperation of the most intelligent members of all professions. Will the American Medical Association endorse the introduction of oral prophylaxis among the children of our public schools by dentists?

I would submit five propositions for consideration:

1. Oral prophylaxis is the art of preventing disease, deformity and injury to the mouth by means of manipulation, instrumentation and skilful surgical treatment.

2. Practical application of oral prophylaxis (prevention by surgical instrumentation) should be made in behalf of public school children.

3. The consent and active cooperation of the school authorities is the most essential consideration now to secure the introduction of oral prophylaxis into the public schools by dentists.

4. The practical application of oral prophylaxis is a problem in economics, because it is the most effective means of combating the spread of contagious disease from oral infection among the public.

5. The solution of the problem lies in the establishment of free dental school clinics for the introduction of oral prophylaxis by dentists.

425 Cooper Street.

ABSTRACT OF DISCUSSION.

DR. A. ZENTLER, New York: The essayist makes the statement that in New York there is only one clinic in connection with the Children's Aid Society Industrial Schools. I presume that it is since the essayist got his information that the second clinic was established, as it had been in existence only a short time. The Strasburg clinic is not supported by the state but by the city. Its establishment is mostly due to the efforts of Dr. Jessen. The city authorities of Strasburg would have done nothing had it not been for Dr. Jessen's efforts. He has proved to the city the need of school clinics, and the city has given its aid. In this connection I think perhaps it would be a step in the right direction in this country, in order to prompt the authorities to do something to this effect, if the dentists in a body were to take some action through which they will prove the necessity of the clinic. In a paper which I read before the First District Dental Society of the State of New York about a year and a half ago, I emphasized this. I have tried to show to the members of that society that the success of the school dental clinics abroad and free dental clinics in general was due only to the profession proving the necessity for these clinics by first doing free work, and then showing that it cannot be continued unless the city or state gives support. I do not mean to say that I feel it is the duty of the profession to go ahead and do this work from a charity standpoint, because that would not be right; but I mean to say that members of the profession must prove first that it is needed, and in this way force the city and state into keeping up what they have begun. This has been done in Germany, Switzerland and France. It has also been done in England, although I cannot state with certainty that in England the city or state gives support to it.

Another point which Dr. Jessen has proved is that in order to do what is necessary for the children in schools, and for that matter in any free dental clinic, the dentists in charge should be paid by the city or state and paid so liberally that they can afford to refrain from private practice. Dr. Jessen believes that no man can take care of a clinic and have time for private practice. In New York there are 300,000 children who need dental care, and unless a man can give his entire time this cannot be accomplished. Of course it is hard to do it in this country, because I do not believe that there is here a system of pensioning after a certain number of years, similar to the one existing in Germany, where a dentist giving his service to a free dental clinic becomes an employee of the city or state—what we call here the civil service—and as such is entitled to an increase in his pay from year to year, and after a certain number of years of service to be retired on a pension. With such prospects, one may refrain from private practice. All the efforts that are made in this direction seem to me to be rather futile until some measure is taken by the profession at large, and perhaps this section, in representing dentists in the American Medical Association, is the proper channel through which the necessity of such a movement be put before both the profession and the authorities.

DR. E. A. BOGUE, New York: It is evident that Dr. Zentler does not realize the necessity for plowing up the field and harrowing and sowing seed before gathering the crop. Many years ago Dr. Atkinson worked for years in New York and

Brooklyn to establish clinics. Seven or eight years ago a man at the head of the Hamburg clinic wrote me to be very careful not to try to establish a dental clinic where the operators were not paid, for it would be sure to fail. This was apropos of an effort made to utilize a gift which had been made in New York and was to become valid as soon as the testator died, and which would devote a certain portion of the income to the care of the teeth of the poor. I wish to emphasize the necessity for all these preliminary efforts which are being made. I also second Dr. Zentler's statement that possibly this body may be of great importance in urging prophylactic measures of all kinds which shall be exerted in behalf of the indigent children and paid for by the state or city as the case may be.

DR. A. IRWIN, Camden, N. J.: The dentist has been accused of practicing dentistry from selfish motives, and to a certain extent he is guilty; but it is also a fact that the dentist has done his duty on many occasions by pursuing his profession for the benefit of mankind. I believe it is the duty of every practitioner to give a certain amount of his time and work without compensation. The physicians in the public schools have been so generous as to monopolize entirely the examinations for discovering the physical condition of the pupils, to the exclusion of the dentist. As a practitioner I am tired of that state of affairs. I think it is about time the dentist was admitted as a member of the corps of examiners to examine the teeth and mouth of the school child. I have been engaged in this work since 1896 in New Jersey, and have met with such determined opposition that the movement was necessarily abandoned for a time. In 1900 while abroad I picked up some information which compelled me to conclude that the United States was far behind other countries in this respect and that we were really guilty of neglect in not attending to the teeth of the children of the public schools. We do not want to pauperize the children of the public schools. If the movement is put on the basis of a dispensary or a free clinic, then the children are pauperized; whereas, if a clinic is established for public school children alone, they take a certain amount of pride in it and they will seek services there and will spread the information broadcast. I am glad that the fact has been brought out that Dr. Ernst Jessen was the father of this movement in Germany. My information comes directly from Professor Jessen and also from Dr. William J. Pike, who is not only a dentist but is now the American consul at Kahl Baden. I think that this Section on Stomatology of the American Medical Association is the proper body to indorse this movement, and this paper was written with the object of soliciting the interest of the members and securing their endorsement of the movement for establishing free dental clinics for public school children.

THE NATIONAL FORMULARY

ITS GENESIS, CHARACTER AND UTILITY *

HENRY P. HYNSON, PHARM. D.

BALTIMORE

Coming from those who had most to do with the conception and inauguration of the National Formulary and from those who have maintained it and are largely responsible for its present character, I confess all things, own all things demanded by truth, and from those who would unkindly criticize and condemn I ask the same tribute to truth, as it lays bare, in proper sequence, contemporary conditions that are exactly responsible for what the formulary has been and is to-day. In this generous, open frame of mind, we shall be able to reason harmoniously together.

"Eye of newt and toe of frog,
Wool of bat and tongue of dog,
Adder's fork and blind worm's sting,
Lizard's leg and owlet's wing."

* Read in the Section on Pharmacology and Therapeutics of the American Medical Association, at the Sixtieth Annual Session, held at Atlantic City, June, 1909.