NOTE: Dr. Rhein then exhibited on the screen a large number of lantern slides of radiographs taken from clinical cases. A few of these are here reproduced.

Figure 1 illustrates a normal physiologic maxilla with the exception of a gold shell cap over the first bi-cuspid. This tooth had been somewhat loose from the irritation produced by this badly constructed cap, and the radiograph shows distinctly that the trouble does not extend much beyond the gingiva of this tooth. The removal of the cap is sufficient to cause the tightening of the loosened tooth.

Figure 2 is a radiograph of the mouth of a man, aged 54. It has a number of interesting features, but the main one centers around the apical portion of the roots of the second molar, which shows a well-defined abscess, although no suspicion of this existed. After this radiograph had been taken the pulp cavity was at once entered and found to be filled with a foul-smelling, putrescent material. In this mouth there were four other teeth in like condition, and the patient's general condition was very much deteriorated as a result of so much septic matter. The removal of these numerous pus foci caused a rapid and marked improvement in the general condition.

Figure 3 shows another mouth with practically the same history. Over the first bi-cuspid can be seen the outlines of a well-marked pericemental abscess. The same condition is evident in the first molar. Neither of these teeth had any fillings or defects in their crowns.

Figure 4 is a radiograph of the same mouth a week after the putrescent pulp had been removed from the first bi-cuspid, and the root had been filled. There is already evident a marked improvement in the tissue conditions around the apex of the root of the first bi-cuspid.

Figure 5 demonstrates the effects of calculary deposit on the side of the root of a molar, and one that has escaped the visual examination of the operator.

Figure 6 illustrates the case described at length of a root filled with cotton over twenty years, when suddenly an intense neuralgic condition started up around the end of the root, due to the abscess shown at the point of the arrow in the illustration. The artificial crown on the first bi-cuspid distinctly shows the root filling, but the fact that the root of the second bi-cuspid has been filled is not at all perceptible in the radiograph, and illustrates the point of the necessity of careful study of radiographs in order to be able to read them properly. This particular abscess was cured by the removal of the cotton root-filling and the application of electrolysis through the end of the root for a period of seven minutes with three milliamperes of current.

Figure 7 is a radiograph of an upper molar after the lingual root had been removed and replaced by a porcelain substitute. The root that is visible is the porcelain substitute.

Figures 8, 9 and 10 show three different stages in the mouth of a man 55 years of age who had been a sufferer from arthritic pyorrhea alveolaris for years. There were numerous pericemental abscesses in this mouth that were located by means of the radiograph. The first and second molars here illustrated were so loose that they wobbled from side to side and could have been easily removed by the patient himself.

Figure 8 illustrates that the pulp of the second molar had been thoroughly removed and the roots filled to the very end. It also indicates that the lingual root had lost all its attachment and was practically a foreign body and should be removed. The first molar was found to be in a still worse condition. The previous dentist had not been able to find the canals of the buccal roots. The lingual root in this tooth is also entirely devoid of attachment and partly absorbed. The first thing accomplished in this case was reopening into the pulp cavity of the first molar and the thorough cleansing of the buccal roots and filling of the same as shown in Figure 9. The lingual roots of both teeth were then amputated and porcelain substitutes for these made. Two iridiumized platinum staples were bent into shape; one extending from the porcelain root to the second molar across the occluding surfaces and into the pulpal cavity of the first molar and vice versa; a staple from the porcelain root of the first molar, across the occlusal surfaces into the pulpal cavity of the second molar. These staples were fastened in with amalgam, which entirely

contoured the crowns of both molars, making a perfect splint, and holding the two teeth rigidly together.

Figure 10 is from a radiograph showing the complete operation of the two teeth splinted together and showing the two porcelain substitutes in place of the necrotic roots that were amputated.

Figure 11 illustrates a superior central incisor with very bad pyorrheal pockets. The tooth was very loose and could be moved in and out at random with the tongue. The wide space between this and the adjoining incisor made the case more than usually difficult. The illustration shows the condition of the parts after it had been successfully splinted to the adjoining lateral incisor.

Figure 12 is a radiograph of a pyorrheal condition surrounding the lower incisor, which, as is readily apparent, was almost ready to drop out of the mouth.

Figure 13 illustrates the method used to preserve this incisor in a firm condition, retaining all the esthetic beauty of this and the adjoining teeth. The splint here shown is only observable on the lingual side and can not be seen without the aid of a mouth mirror.

38 East Sixty-first Street.

INTERSTITIAL GINGIVITIS DUE TO AUTOINTOXICATION

AS INDICATED BY THE URINE AND BLOOD PRESSURE
—DIAGNOSIS.*

EUGENE S. TALBOT, M.S., D.D.S., M.D., LL.D.
CHICAGO.

In a former paper, "Interstitial Gingivitis Due to Autointoxication," I discussed etiology; in my work on "Interstitial Gingivitis, or So-called Pyorrhea Alveolaris" I demonstrated the pathology; in this paper I propose to discuss the method of diagnosis in interstitial gingivitis. It has been demonstrated that this disease originates from autointoxication. It is justifiable, then, to state that interstitial gingivitis is dependent on the circulation and the vasomotor system. It is, then, a profitable subject for investigation. Before discussion of this phase of the subject, it is necessary to become familiar with the structures involved, which in themselves are unique. There are no other structures in the human body like them. I have gone into details many times in a description of these structures. I will now only discuss them in a general way. The alveolar process is a bony structure intended to hold the teeth in position; when the teeth are removed the process absorbs; therefore, it is a transitory structure. In the evolution of the head, face, jaws and teeth, the process including the jaws grows smaller, the teeth and process change their shape, making the alveolar process doubly transitory. Transitory structures are more easily involved by disease than any other. Some of the lower vertebrates shed their teeth continuously. A tooth comes into place, is used a short time, is shed and a new one takes its place. This continues throughout the life of the animal. Man has two sets. He sheds the first, after they have performed their functions, and a new set takes its place. As soon as the alveolar process has developed about them a low form of inflammation sets up absorption. I have called this osteomalacia or senile absorption. This form of absorption will continue until the teeth loosen and drop out or are extracted. It is an atavistic process. The alveolar process is an end organ. The tooth, so far as the process is concerned, is a foreign body. The arteries, capillaries and nerves pass through the bony process and stop.

* Read in the Section on Stomatology of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

There are other end organs in the body, chief of which are the kidneys, the eye and the brain. Physicians claim, and rightly, that, because these are end organs, they are more easily involved in disease and are often the determining factors of kidney lesions. Alfred C. Croftan¹ says: "It is not surprising to find that particularly those organs that are supplied by end arteries are chiefly involved, for in them vascular disturbances must first produce nutritional derangement. Chief among the organs supplied by end arteries are, precisely, the kidneys, the retina and the brain, and, I think, this explains the frequent involvement of the kidneys, eyes and brain in Bright's disease. The fact that the retina and the brain are often found injured before the kidneys, that cases of Bright's disease run their fatal course occasionally with practically no renal changes, but with serious apoplectiform brain lesions and retinitis, bears out this conception and constitutes a valid argument against the common belief that the nephritis is the primary event and the determining phenomenon of the disease."

A marked difference exists between the kidney, eye and brain as end organs and the alveolar process as an end organ. This difference is the important point in the study of interstitial gingivitis. End arteries running into the kidney, eye and brain, owing to their soft nature, give the arterial walls a chance of expansion, permitting, in a measure, the blood to flow more easily and prolonging the tendency to disease. On the other hand, blood vessels extending throughout the alveolar process in a tortuous manner can not expand, as the result of which blood charged with toxins and subject to cardio-vascular changes immediately sets up irritation and inflammation resulting in dilatation, bone absorption and arterial degeneration. These changes, therefore, will occur much earlier in the alveolar process than in other end organs.

This is apparent to every physician in the more marked systemic disturbances, such as scurvy, malaria, drug poison, constitutional disease, etc.; the gums and alveolar process are symptomatic and are watched with greatest care. The severity of the disease, as well as its progress, may often be determined by a careful scrutiny of these tissues. It is the more obscure and simple etiologic factors to be considered at this time. The pathology is the same, whether the cause is mild or severe.

In tracing the etiology of this disease, it is at once cognizant that as one grows older the milder forms of this disease become more severe. Every individual has interstitial gingivitis to a greater or less extent. We are able, therefore, immediately to arrive at its etiology, autointoxication due to a want of proper elimination. The excretory organs of the body weaken and become senile. As age advances, the kidneys and bowels fail to perform their functions properly. We are conscious, therefore, of self-poisoning by the odor exhaled from the lungs and bodies and the accumulation of gases in the gastrointestinal tract. The effects of autointoxication on the gums and alveolar processes direct through the blood-producing interstitial gingivitis, together with the peculiar odor from the lungs and body, are, to the expert, valuable early signs of more grave lesions about to occur in the kidneys, heart and arterial systems throughout the body, especially the kidneys.

For the past ten years, I have given special study to the constitutional condition of interstitial gingivitis as indicated by the urine, the only means at hand of ascer-

taining the general condition of the system. The cases I wish to report are the first fifty, ranging from 27 to 67 years of age. All had interstitial gingivitis in its most aggravated form, with more or less loose teeth. Thirty-two had lost teeth as a result of the disease. Fourteen had pyorrhea alveolaris observed by the naked eye. The teeth were cleaned. The loose teeth were either extracted or fastened to other teeth. Twenty-four hours urine was obtained. A part or all was sent to the Columbus Medical Laboratory for examination. In tabulating the reports, the following results were obtained:

Specific gravity, two had 1005; two, 1006; two, 1007; two, 1008; two, 1009; one, 1010; one, 1011; one, 1012; two, 1013; six, 1014; one, 1015; five, 1016; two, 1017; one, 1018; five, 1020; three, 1023; one, 1024; three, 1025; one, 1026; two, 1027; one, 1028; two, 1029; one, 1031. There were granular casts in six reports. Hyaline casts in twelve; cylindroids in twenty-two; degree of acidity showed, one had 11 degrees; two, 12; one, 14; two, 15; one, 16; two, 17.5; four, 20; one, 22; one, 24; five, 30; seven, 36; two, 40; two, 44; one, 46; two, 56; one, 58; one, 59; one, 60; two, 62. The urea showed, two had 0.3 per cent.; one, 0.5; two, 0.6; two, 0.7; two, 0.9; two, 0.1; one, 1.1; two, 1.3; one, 1.4; four, 1.5; six, 1.6; one, 1.7; three, 1.8; one, 1.9; one, 2.0; three, 2.1; three, 2.2; two, 2.4; six, 2.5; two, 2.6; one, 3.0; one, 3.1; one, 7.1. Albumin was found in four cases; blood in six; leucocytes in forty-five; epithelial cells in forty-six; uric acid crystals in two; urates in five; oxalates in fifteen. Indican was present in every case. To make a more complete study of each individual case the following table has been prepared:

Specific gravity.	Granular.	Casts. hyaline.	Cylindroid.	Acid. degree.	Urea. per cent.
23	0	0	0	60	2.5
20	1	1	1	56	2.5
8	0	0	1	20	1
6	0	1	1	12	.6
12	0	0	0	36	1.5
31	0	0	0	44	2.6
29	1	1	1	46	2.2
16	1	1	1	52	2.2
11	0	0	1	17.5	1.4
17	0	0	0	17.5	1.6
27	0	1	1	62	2.1
20	0	0	1	24	2.2
25	0	1	0	44	2.4
9	0	0	1	16	1.5
25	1	1	1	40	3.1
29	1	1	0	58	2.6
14	0	0	0	36	2
16	0	0	0	30	1.8
14	0	0	0	30	1.5
13	0	0	0	36	1.6
13	0	0	0	36	1.6
15	0	0	0	36	1.7
15	0	0	1	15	1.6
14	0	0	0	36	.9
28	0	0	0	36	3
5	0	0	0	..	.3
16	0	0	0	..	1.6
20	0	0	0	..	1.5
10	0	0	0	..	1.1
25	0	0	1	..	2.5
27	0	1	1	62	2.1
25	0	0	0	..	2.5
14	0	0	1	36	1.3
20	0	0	0	..	1.9
24	0	0	1	..	2.4
26	0	0	0	..	2.1
18	0	1	1	..	1.6
14	0	0	1	36	1.3
5	0	0	0	15	.7
23	0	0	1	40	1.8
7	0	0	0	14	1.3
16	0	0	0	30	1.8
9	0	0	1	11	.9
14	0	0	1	22	1.5
7	0	0	0	26	.7
7	0	0	0	20	7.1
23	0	0	0	60	2.5
20	1	1	1	56	2.5
8	0	0	0	20	1
6	0	1	1	12	.6

TOTAL EXAMINATION OF URINE.

Qualitative Examination.	Quantitative Examination.
Physical condition:	Indican,
Clear, 17.	50.
Cloudy, 33.	
Reaction:	
Acid, 46.	
Alkaline, 4.	
Color:	Microscopical Examination.
Yellow, 46.	Casts:
Amber, 4.	Hyaline, 14.

1. The Alkaloidal Clinic, July, 1905.

Odor:	Granular, 7.
Negative, 46.	Epithelial, 1.
Present, 4.	Cylindroids, 21.
Mucin:	Cells:
Present, 30.	Blood, 4.
Absent, 20.	Leucocytes, 45.
Albumin:	Pus, 11.
Present, trace 4.	Epithelial cells, 46.
Absent, 46.	Crystals:
Peptones:	Uric acid, 2.
None.	Urates, 5.
Sugar:	Oxalates, 15.
None.	Phosphates calcium, 1.
Bile:	
None.	
Blood:	
Present, 6.	
Absent, 44.	

These tables indicate either renal insufficiency or excessive suboxidation products producing renal strain. Where the degree of acidity exceeds forty degrees, there is excessively imperfect oxidation which, irrespective of the types of acid, underlies, as is now pretty generally recognized, severe constitutional stress allied to that of diabetic acidosis. Where the degree of acidity falls below thirty degrees, similar states occur, as G. F. Butler² has pointed out, from insufficient elimination. The degree of acidity is obtained by taking 5 c.c. of the urine specimen, plus two drops of phenolphthalein solution as indicator, adding decinormal NaOH until a slight pinkish color is produced. The number of c.c. of N/10 NaOH required multiplied by 20 equals the degree of acidity. Another great source of acid is the resorption products from imperfect intestinal fermentation, like indol, which is eliminated by the kidney as indican, greatly stained thereby. Wherever there is an endogenous or an exogenous poisoning with which the liver is unable to cope and the strain is thrown on the kidney, elimination proceeds through the skin, nasal and buccal mucous membranes, and hence through the alveolar process, since the last contains end organs in which useless products settle. This produces, for example, the blue line of lead poisoning, the green of copper and red of mercury.

The tendency to graver diseases as here presented is shown in the inflammation and absorption of the alveolar process. The physical condition, reaction, color, odor, mucin and the cells (since they are apt to be of local origin) are of little significance. Crystals are of limited value, since the longer the urine stands before examination the larger the number of crystals. The amount of uric-acid crystals confirms my report of some years ago.³ In these experiments, teeth with deposits on them were extracted in which excessive absorption of the alveolar process had taken place. One hundred were sent to one laboratory and one hundred and fifteen to another. They were examined for uric-acid crystals by the hydrochloric test, the dry distillation and the murexid test. By the murexid test, twelve of the two hundred and fifteen gave positive reaction, and by the microscopic ten showed crystals, or about 5 per cent. The microscopic examination of urine in forty-six cases revealed two cases, or about 4 per cent.

Croftan⁴ says: "While hyaline casts do not necessarily indicate nephritis, i. e., advanced renal inflammation, they nevertheless indicate renal irritation and should be regarded with suspicion. Covered with blood or renal elements, their pathologic importance becomes great, since their appearance then indicates distinct renal inflammation.

Urine containing hyaline casts often contains albumin

in solution. The amount of coagulable albumin in solution may be minimal and, though rarely, albumin in solution, detectable by ordinary clinical methods, may be absent. The absence, however, of albumin does not exclude renal irritation nor even certain forms of nephritis.

To the category of hyaline casts probably belong the cylindroids, long bands and cylinders. These, like the hyaline casts, must be considered coagulation products of albuminous material that the tubular epithelia exude in small quantities. The factors that cause this exudation are not always determinable. Cylindroids of distinctly tubular origin are pathologic in the same sense as hyaline casts. They are often found in urine otherwise apparently quite normal. Neither they nor hyaline casts, therefore, can be considered typical evidences of patho-anatomic renal lesions, but are common in heart disease, with congestion of the kidneys, in a variety of toxic and infectious states and in irritation of the tubuli by crystals in acidosis and after epileptic fits."

Cylindruria, according to Simon,⁵ is not necessarily associated with definite pathologic alterations of the renal parenchyma. This statement should likewise be accepted as to the occurrence of purely hyaline casts and their presence in small numbers. A few renal epithelial cells may be found at the same time occurring either in the urine or adhering to the casts, but never presenting an atrophic or otherwise altered appearance in the absence of definite renal lesions. The presence of compound hyaline and coarsely granular casts, as well as of waxy and amyloid casts, on the other hand, may be regarded as indicating definite changes in structure, so that, as far as diagnosis is concerned, microscopic examination of the urine furnishes information of more value than simple demonstration of albumin.

Hyaline casts are most frequently seen—reference is here had only to the purely hyaline or, at least, but faintly granular form—and are found in all conditions in which albuminuria occurs. When present in only small numbers, and particularly when occurring but temporarily in the urine, it may be assumed, in the absence of other symptoms pointing to renal disease, that there is a mild circulatory disturbance of the kidneys. Granular casts, according to Croftan,⁶ invariably indicate either inflammatory processes in the kidneys or advanced circulatory disturbances (cyanotic induration). They are almost pathognomonic of nephritis, especially when coarse. The significance of blood and epithelial cells imbedded on hyaline casts is the same as the significance of blood and epithelial casts; both are pathologic and indicate nephritis. Fine granular and hyaline casts often occur from autotoxic strains on congenitally insufficient kidney in arthritic and allied states.

The presence of albumin in these cases was exceptional, it being found in but four cases. This would show that in none of these cases had disease become very marked. When present, it does not in itself indicate grave disorder, since albumin may be due to many conditions of the renal tract. It is of interest to us, since disturbance of circulation may bring about albuminuria without inducing structural change in the kidney. Purdy says: "Circulatory disturbances, in order to induce albuminuria, must include the renal vessels. In Nature they must consist of acceleration of the arterial current or slowing of the venous current, in either case resulting in increased blood pressure. . . . Again,

2. American Medicine, vol. x.

3. "Pyorrhea Alveolaris," International Dental Journal, April, 1896.

4. Clinical Urinology, p. 246.

5. Clinical Diagnosis, p. 629.

6. Clinical Urinology, p. 248.

in some derangements of the nervous system which interfere with the vasomotor nerve regulation of the renal vessels, temporary albuminuria is not an uncommon result." Albuminuria is present in autotoxic neurasthenia, epilepsy, parietic dementia, and the renal crises of locomotor ataxia.

The specific gravity ranges from 1005 to 1031, normal specific gravity ranging from 1015 to 1025. The difference depends on the amount of solids and fluids present, increasing as the solids increase, decreasing as the amount of fluids increase. Specific gravity is, hence, an index, in a general way, of metabolic change. The low degree of acidity would indicate that a certain amount of acid was circulating throughout the system.

Critical examination of these tables must convince a careful observer that in every examination two conditions are present: First, autoinfection due to intestinal fermentation and faulty elimination as represented by the indican; second, kidney overstrain and renal insufficiency due to hepatic insufficiency. When the liver fails to destroy the poisonous materials and the bowels to eliminate the toxins, overstrain of the kidneys causes the blood to become overcharged with toxins and acidity and the heart and arteries undergo degenerative changes. Cardiac hypertrophy and cardio-vascular diseases with insufficient blood supply result.

Just what the toxins or their chemical characters are, we are unable to determine at present. It would seem, however, they are unoxidized products of metabolism, as poisonous ammonium salts, xanthin and hypoxanthin, which when normally excreted from the system are in the form of non-toxic substances. Croftan⁷ injected these alloxuric bases in small doses in animals, producing changes in the heart, arteries and kidneys, characteristic of Bright's disease. How these toxins act on the circulatory system is not yet fully determined. It would seem from experiments that they act in different ways. Some on the vasomotor nerves, others on the heart muscle direct, and still others on the peripheral arteries, especially those of end organs. It is known that the heart and arteries become involved before the symptoms of Bright's disease are observed.

"The old idea, then, that in Bright's disease the kidneys are primarily involved and that as a result of renal insufficiency certain excrementitious bodies are retained that produce the changes about the heart and arteries, the eye ground and brain is not tenable. This course of events sometimes occurs in toxic and infectious forms of acute and subacute nephritis, but such cases are not Bright's disease." That the heart and arteries in end organs are the first involved in autointoxication as a result of intestinal fermentation, hepatic and renal insufficiency and drug poisoning has been fully demonstrated. The heart becomes enlarged and a high blood pressure is developed. Dilatation of the arteries results, especially those in end organs, resulting in arteriosclerosis, which is present in every case.

To ascertain the blood pressure in patients suffering with interstitial gingivitis, I used Cook's modification of the Riva Rocci sphygmomanometer, this instrument being best adapted for my convenience, and is exceedingly simple. The armlet used was sold with the instrument and consists of a rubber bag, 4½ by 40 cm. The patients ranged from 27 years to 67. With this instrument the normal adult female's arterial blood pressure is 115 to 125 mm.; adult male's, 125 to 135 mm. In twenty-six females there were three who

ranged between 115 mm. Hg and 125 mm. Hg and, therefore, normal. Three ranged below 115 mm. Hg and twenty from 133 mm. Hg to 180 mm. Hg. In twenty-four males there were eight who ranged between 125 mm. Hg and 135 mm. Hg and, therefore, normal. Three ranged below 125 mm. Hg and thirteen from 133 mm. Hg to 160 mm. Hg. When we consider thirteen of these patients were under 45 years of age, the high blood pressure is remarkable.

I have been unable to demonstrate whether the interstitial gingivitis is accelerated directly because of the poisons circulating in the blood vessels, causing high blood pressure because of their action on the heart, or because of their action on the vasomotor nerve governing the heart or blood vessels, or both. The effects of the toxins and extra blood pressure is to set up irritation and inflammation of the outer surfaces of the Haversian canals producing haliteresis, in the vessels of von Ebner producing Volkmann's perforating canal absorption and setting the osteoclasts at work, all producing absorption of the alveolar process.

The question arises, Which end organ is the most susceptible and first involved in autointoxication? When a man visits the physician for treatment, one of the first questions asked is, "What is your occupation?" If the man replies he is working in drugs, metals or mines, the physician examines his patient's gums to note if his system be saturated with poisons. If a physician be treating a patient for lues, the drug is administered until the "gums are touched," which is the only indication his patient is under the influence. One of the most marked symptoms of scurvy is the inflammatory condition of the gums and alveolar process, which are always taken into consideration in diagnosis.

Physicians agree the arteries in such end organs as the kidneys, brain and retina dilate under blood pressure. The arteries ramify in bone structure only imperfectly, if at all. Arteries entering transitory bone structures gradually undergo pathologic changes. After the individual has obtained his growth, they are certainly more susceptible to toxin poison and blood pressure than those either in the kidney, brain and retina. I have demonstrated these pathologic changes in the alveolar process in my work on "Interstitial Gingivitis or So-called Pyorrhea Alveolaris."

Some of the following are expected to develop: Headache, irritability, fatigue, muscle soreness, hypochondriasis, vertigo, neurasthenia, lethargy, stupor, insanity, cutaneous affections, such as pruritus, acne and urticaria; later arteriosclerosis, gout, rheumatism, Bright's disease, diabetes, uric-acid diathesis, nervous disorder, asthma, anemia and many other diseases. Before most of these conditions are apparent, interstitial gingivitis will have become firmly established, with marked recession of the alveolar process and often times loosening of teeth.

DISCUSSION.

ON PAPERS OF DRs. RHEIN AND TALBOT.

DR. M. I. SCHAMBERG, Philadelphia, said that although there are some advocates of entirely local causes of pyorrhea or interstitial gingivitis, he is convinced that men who make a careful study of this obstinate disease, which is so refractory to treatment, are of the opinion that there are underlying causes for pyorrhea which are distinctly of a constitutional nature. He agreed with Dr. Talbot as to the necessity for more frequent examinations of the blood and urine in these cases. During the past few years he has been examining the urine in all cases of pyorrhea that come to his attention, and it is remarkable to note the number of cases in which either diabetes, Bright's disease, or an excess of uric acid may be found.

7. American Journal of Medical Science, 1900.

DR. M. H. FLETCHER, Cincinnati, said that a large part of his professional time is devoted to the treatment of these cases. He agreed that this trouble is of local origin, with systematic complications of many varieties, and he considers it interesting to note that the trouble in these cases will disappear by local treatment. It is a well-known fact, he said, that the conjunctiva, or other mucous membranes of the body, are irritated in the dry stage of inflammation. Every tissue of the body is subject to irritation, with accompaniments of systemic trouble. Dr. Fletcher believes in a local cause for many disorders. It is a fact, he said, that every disease has its nervous phase; many diseases are now known to be purely nervous which were formerly thought to be organic. Any condition which produces a continual irritation may produce systemic disorders of a severe nature, and he is convinced that the systemic disorders referred to are brought about by the local irritation, which is continuous. There is an effort to throw off this foreign body, and this continuous effort of Nature to restore herself to normal results in the destruction of the tissue about the teeth, with the result that finally a pathologic or diseased habit is established; and in no instance can it be cited that this trouble does not disappear by removal of the teeth. Dr. Fletcher said that it has fallen to his lot to do considerable work in the antrum, and in hundreds of examinations of the mouth and skull he has failed to find the antrum as far forward as the canine, and in but twelve cases in a thousand antrums has he found that the roots of the teeth produced a tubercle in the floor of the antrum, as shown by Gray and other anatomists. He has found abscesses of the molar teeth discharging in the antrum where the roots come against the floor of the antrum; the roots are often uncovered, so far as bone is concerned, just as all practitioners know; on the outer surface of the alveolar process the bone is completely gone and the root covered with nothing but soft tissue. Now it is easy to understand that in gingivitis going up the root in a case in which there is no body covering to the root in the floor of the antrum, there will be extension into the antrum, with all the accompaniments. This disease is something to which Dr. Fletcher thinks stomatologists must give more attention. He has never seen a patient in whom there was not more or less calcareous deposit. He has seen a case of pyorrhea in a child of ten. In other ways the child was perfectly healthy; the disease evidently had been caused by calcareous deposit.

Dr. G. V. I. BROWN, Milwaukee, said that it might be of interest to recall something of the progress of the science of this particular affection, as Dr. Talbot has brought it out. His earlier papers demonstrated, for the first time by actual microscopic study, that this disease was considerably in advance of what he had been accustomed to recognize as diseased tissue of this character. His first series of slides showed that. He next took up the question of auto-intoxication, and showed by slides the relation of those conditions in this disease, and again of that kind of poison to mineral and other poisons, bringing it all down to the simple proposition of an absorption and taking into the system of poison which was disastrous to tissue, which affects, first of all, that portion supplied by the very small vessels and structures of a transitory nature, such as the alveolar process. Dr. Brown said that we have all heard and read for years of the uric acid diathesis, and its relation to this disease; and now we find that uric acid, while it is a factor and sometimes represents associated disease, it is only one of many disturbing elements of a somewhat similar character.

Dr. M. H. FLETCHER, Cincinnati, said that this discussion has shown unquestionably the local features of this disease, and according to his mind the proposition is quite simple; with the system loaded with intoxication there is less resistance to any kind of an irritation. If, under these circumstances, there is local irritation in this region, there is as a result a condition which we recognize in the disease. It is a well-known fact, he said, that affections of the kidneys, or other organs, weaken their powers of function, especially that of elimination, laying all the tissues especially liable to disturbance from any kind of irritation. Now, if we supply the irritation about the teeth, we produce the disease. If we remove the irritation and the intoxication, to that extent we relieve the condition and the disease.

Dr. VIDA A. LATHAM, Chicago, said that this exhibition of Dr. Rhein's proves almost conclusively that the stand taken by some of the members of the Section, that dentists are pure mechanics, is certainly out of order. Dr. Latham said that we can not do without the scientific branches. Dr. Rhein's exhibition, she said, to-day has shown that the mechanical filling of those canals, their anatomic bearings, the relations of those tissues and the far-reaching effects mentioned by Dr. Talbot, have brought together both the scientific and the mechanical aspects, as perhaps has never before been done. Dr. Latham said that we have to deal with another set of tissues, the mucous glands, which form around and in the peridental membrane, and that there is a bearing of the mucous glands in the peridental tissue which has to deal with the question; these glands are also affected by the end organs, and by the arterial changes. What the exact histologic and anatomic conditions of those mucous glands are we do not know. Dr. Latham declared that it can truthfully be said that in some lines dentistry has advanced far ahead of medicine. But in these particular lines—the scientific and anatomic—we are not advancing as rapidly as in the mechanical.

PALLIATIVES FOR HAY FEVER.

SOLOMON SOLIS-COHEN, M.D.

Professor of Clinical Medicine in Jefferson Medical College.

PHILADELPHIA.

Since 1898, when I made the first announcement of the value of preparations of the suprarenal gland in the treatment of hay fever,¹ I have made many observations on myself and others with a view to determine the best of these preparations and the best method of application and administration. I have also made observations with other promising palliatives, especially pollantin. The results may be summed briefly.

I. SUPRARENAL PREPARATIONS SYSTEMICALLY.

For some individuals, and in certain seasons, the systemic action of suprarenal preparations suffices to induce and preserve comparative comfort. The stomach, however, as I have previously pointed out, is not an eligible channel of administration. The medicinal substance must be absorbed from some other mucous membrane, where it can escape exposure to the digestive juices and the action of the liver. The eye, the tongue, the nose, the pharynx may be utilized. It was, and still is, possible to attain results by using the old crude preparations of suprarenal substance, but the active principles are more easily managed on account of their effectiveness in the minutest quantities. I have employed both the adrenalin chlorid solution of Takamine and the epinephrin of Abel; the latter being marketed by a manufacturing firm under the name of suprarenalin. Suprarenalin, which appears in the form of a non-hygroscopic powder, may be made into very small tablet triturates, each containing from 1/40 to 1/10 of a grain (1.5 to 6 milligrams) of the active substance, with a small quantity of sugar of milk; and this being placed on the tongue quickly dissolves, is absorbed and becomes therapeutically active. The quantity of sugar of milk used should be the least possible to make a triturate that can be handled. I have to thank Mr. F. E. Morgan, of Philadelphia, for his skill in making for me these very small tablets, as also for his efficient co-operation in my experiments with various diluent powders, as set forth later in discussing the topical action of suprarenal preparations. The dose of suprarenalin that I find effective in my own case is 1/20 grain (0.003 gm.), placed on the

1. Philadelphia Medical Journal, Aug. 13, 1898.