

ability of the men who have had these subjects under consideration. This state owes a great debt to Hastings Hart, as chairman of the board of charities and correction for some years, now in New York; and is under great obligations to the State Board of Control, both to the present members and to all the members who have constituted that board since its inception.

I think that perhaps the subject of the institutional care of our different classes of dependents, defectives, etc., is better worked out than the other side of the question. It is said that one-half of the world does not know how the other half lives. How much do we know about the families of these men in the state prison, the state hospitals, the reformatory, in the children's school, and all the different state institutions?

Under the able management of the State Board of Control, the state prison not only supports itself but has a surplus through the industry of its inmates; and provision has been made so that part of the earnings of these men is devoted to the support of their families. But what about the families of the insane? What about the families of the tuberculous men? Perhaps that is one of the reasons why it is difficult to get a man with tuberculosis, if he has a family, to go to an institution, when he does not know where the bread and butter is coming from for his wife and children. How is he going to leave his family when his mind and heart are torn with anxiety about the welfare of his loved ones?

But we are getting at that, too, under the auspices of the university. The movement for community service is beginning to get at the problem on that side. Until the community feels the same obligation to look after the families of those people that they do with other classes, we shall not be successful in conducting our state institutions on the lines on which we wish them to be conducted.

It is good to meet a body of this kind. There are so many angles to every question that no one man is capable of presenting any one of them from every standpoint. At these meetings one man reads a paper, another man gives his ideas from another angle, and in this way we get a more comprehensive idea of the whole subject. And I am glad that the ladies are here. While man is the breadwinner and the earner, when you really want to get a thing done you go and ask the ladies to do it. I think some fitting memorial should be erected which shall commemorate the work which the women did in the late war. The men did well, nobly, all that they were called upon to do, but the women did even better, not only in this country but in all countries. In this work in which we are engaged, in every phase of the reformatory, correctional, and mere institutional care, we can not do better than to get those women interested in the subject to meet with us and give us their ideas. We may be sure, however smart we think we are, some woman will come up and give us a new idea. I got one myself this afternoon. I went through one of the cottages, and being associated with so many old ladies in the Soldier's Home, I said to an old lady, "Well, Grandma, how are you?" She said, "I ain't a grandma; I am an old maid."

Dr. Hall: I think this: You want to get out of the minds of the people the idea of diseases being spread by bacteria. If I had my way I would have an edited copy of Chapin's "Sources and Modes of Infection" taught in the public schools of the United States every day of the year. People become confused.

Chapin has taught that diseases are conveyed by contact, and the only protection that is necessary is what? Absolute cleanliness. Let me give you an illustration.

Take the new contagious hospital in Minneapolis today. They are treating six different diseases on the same floor and there is no cross infection. How? Simple technique of the hand.

Why can't we teach the daily to do it the doctor and the nurse can do it? If we teach the people instead of letting them think that these diseases are coming through some hocus-pocus, they will protect themselves.

Last year we had an epidemic of influenza. And yet, if the people were educated along the line of protecting themselves by cleanliness, educated along the line that disease comes by contact, you would not have epidemics. You can talk about protective serums; you never get anywhere. I can't protect myself. I was in service in the Minneapolis city hospital twenty-five years. People think the doctor is especially protected. He doesn't take anything but a bath once in a while.

ARTERIOSCLEROSIS IN THE FEEBLE-MINDED.

W. A. Erickson, M. D., Senior Physician, School for Feeble-Minded.

Definition: Arteriosclerosis is a circumscribed or diffuse primary degeneration of the arterial walls, with subsequent fibrosis resulting in calcification and fatty degeneration.

ETIOLOGY

1. Active causes
 1. Increased strain on vessel walls, from any cause
2. Toxic causes
 1. Alcoholism (chronic)
 2. Coffee
 3. Tea
 4. Tobacco
 5. Chronic lead poisoning
 6. Toxins produced by perverted metabolism, such as in:
 1. Interstitial nephritis
 2. Gout
 3. Diabetis
 4. Obesity
 5. High living
 6. Overeating, etc.
 7. Toxins in certain diseases, such as:
 1. Syphilis
 2. Tuberculosis
 3. Typhoid
 4. Rheumatism
 5. Influenza
 6. Scarletina, etc.
2. Predisposing causes
 1. Age Arteriosclerosis is the essential element in senile involution, although some individuals attain their one hundredth year

without arterial change. Though usually found after the fiftieth year, hereditary influenza, syphilis, certain acute and chronic infections heretofore mentioned, may develop hard arteries before the fortieth year, in adolescence or even in infancy.

In the feeble-minded patients at Faribault, we find that arteriosclerosis in infancy and early childhood is very prevalent.

We found in our physical examination of the inmates that before reaching the second year 10.8 per cent of them have well developed arteriosclerosis.

At the 6th year the percentage is	11.3
At the 10th year the percentage is	12.2
At the 15th year the percentage is	8.7
At the 20th year the percentage is	6.3
At the 25th year the percentage is	3.9
At the 30th year the percentage is	2.8
At the 40th year the percentage is	4.2
At the 50th year the percentage is	6.3
At the 55th year the percentage is	7.1

From these figures it appears that we are dealing with two types of arteriosclerosis in the feeble-minded as far as this predisposition cause is concerned. The first form is very frequent in infancy and early childhood, caused by hereditary factors and the toxins of the various infectious diseases, and contributes to the cause of death from whatever source, but hardly ever causes death directly. At the 30th year only 2.8 per cent of such inmates are alive and from the 30th year on the percentage mounts and includes the second group of cases, whose etiology is quite different.

2. Sex Arteriosclerosis occurs four times as frequently in the male as in the female. In the feeble-minded the cases are equally divided, the two sexes suffering to the same extent.
3. Congenital smallness of the vessels (arterial hypoplasia)
4. Congenital weakness of the vessel wall
(These two factors, 3 and 4, play an important part in bringing about arteriosclerosis after the 20th year)
5. Tumors, depressing the vagus nerve, compressing the splanchnic area, and exophthalmic goitre, are important etiologic factors.
(All of our cases of exophthalmic goitre presented well developed arteriosclerosis)
6. Miscellaneous causes:
 1. Nutritional disturbances
 2. Kyphosis
 3. Lordosis
 4. Scoliosis
 5. Embolism
 6. Thrombosis
 7. Nervous disorders, capable of raising the blood pressure

Pathogenesis.

Thoma's theory: (Primary lesion is in the media, due to an initial increase in the blood pressure).

The first change is a weakening of the vessel wall and a subsequent dilatation of the wall at the point of weakening. If this process is of sufficient extent, the result will be an aneurism, but before it has progressed this far and after a degeneration of the elastic membranes and slowing of the blood stream subsequent to the dilatation, a compensatory proliferation of the intima takes place. This newly formed proliferated tissue leads to a fibrosis. Thus we have a vessel composed almost entirely of fibrous connective tissue at the site at which the original injury took place. Like all scar tissue it contracts and cuts off the nutrients originally obtained through the intima from the lumen of the vessel. Because of this failure in nutrition we have a new degeneration, usually of a fatty nature, and followed by a fibrosis and calcification of the media and intima. If, however, this secondary fibrosis and calcification does not take place, the result is the formation of an atheromatous ulcer or abscess.

Marchand's theory: (Primary lesion in the intima due to the action of toxins circulating in the blood).

The toxins circulating in the blood cause inflammation of the intima, this being the primary change. This heals by second or third intention, thereby causing scar tissue to be formed.

The formation of the scar tissue mentioned cuts off the blood supply originally obtained by the inner portion of the media from the lumen of the vessel. This interference with the nutrition from that source results in a degeneration of these layers of the media. This is followed by fibrosis in the degenerated area. From here on the process is the same as that described under the theory of Thoma.

Syphilitic type: In this type there is a small round celled infiltration of the adventitia along the course of the vasa vasorum. This infiltration is followed by secondary changes in the intima and media. The changes in the media are marked atrophy of the muscle and elastic elements, resulting in degeneration and necrosis. This is followed by a fibrosis but not a calcification as in other types of arteriosclerosis, owing to the new formation of blood vessels in the syphilitic type.

Senile Type: In this type we note primarily the vessel wall giving away due to long use and the wear and tear. The elements of the wall that give away are the elastic fibres of the media and intima. Compensatory fibrosis now takes place, which is followed by a degeneration and calcification.

Location: Arteriosclerosis may occur in any part of the vascular system, but the type occurring most frequently in the tortuous arteries as the circle of Willis and the coronaries, for example, seems to be the nodular variety. Likewise it is noted that the diffuse type occurs most frequently in the straight arteries, as the radial, ulnar, etc. However both forms may exist in the same vessel at the same time, usually one form predominating over the other. Arteriosclerosis is rare in the gastric, mesenteric and hepatic arteries. It is least frequently found in the pulmonary trunks.

Sclerosis of the renal vessels may precede or accompany nephritis.

Gross Pathology: Externally we observe that the small arteries are tortuous beaded and enlarged, the medium sized arteries being tortuous hardened, deformed, lengthened, lumen obliterated or narrowed. The walls

are firm, uneven, nodular and with hardened plaques. The large arteries, such as the aorta, show dilatations and aneurismal bulgings.

Internally we observe thick hard plaques, cysts, ulcers and dilatations. Small, gelatinous or yellowish, fatty areas are seen sometimes circumscribed, but usually coalesced into larger plaques; they occur where arterial pressure is the greatest, as in the aortic arch or where the vessel divides or gives off branches, as the subclavian or intercostal branches. The plaques of atheroma or nodular arteriosclerosis represent nature's effort to fill out areas of degeneration and dilatation and thus even the calibre of the vessel.

Histopathology: Microscopically the intima may be increased three- or four-fold from swelling, increase of connective tissue and round cell infiltration. Fatty needles and cholesterol plates are seen in the atheroma plaques. Atheromatous areas at times rupture into the lumen of the vessel and produce the atheromatous ulcer, which may cause embolism thrombosis and occlusion. Deposit of lime in these areas usually takes place, except in syphilitic cases, and causes calcification. The lumen of the small vessels is decreased or obliterated. The middle and outer coats at times are thickened by hyaline degeneration and the formation of excessive fibrous tissue; the muscular coat appears wasted and practically all of the elastic tissue has atrophied.

General results of arteriosclerosis, circulatory changes secondary to vessel changes.

1. Vascular inelasticity
2. Deformity, tortuosity, obliteration of lumen of vessel
3. High arterial tension
4. Thrombosis, embolism and infarction in the spleen, kidneys, lungs, brain and intestines
5. Dry gangrene and sometimes Raynaud's disease

Associated pathology

1. Hypertrophy of the heart, especially of the left ventricle, due to increased system pressure and resistance later and incompetent mitral valve, followed by a sudden or gradual broken compensation,
2. Interstitial nephritis, caused by a diffuse sclerosis of the arteries, thus mechanically raising the blood pressure
3. Diffuse pancreatitis, caused by a sclerosis in the pancreatic arteries, causing nutritional disturbances
4. Brain lesions, such as haemorrhage, softening and atrophy
5. Gastric ulcer
6. Arteriosclerotic gastritis
7. General wasting and anemia due to impaired circulation
8. Senile gangrene of end arteries

Symptoms in pre sclerotic stage: Early symptoms are local changes in circulation, that may appear for the first time after undue excitement, exertion in cold weather or in mild infections such as bronchitis, which results from stasis to a mild degree. The arterial tension rises slightly, the patient tires more easily than formerly, and one may note slight swelling of the ankles. Early nervous symptoms are headache, irritability, emotivity, somnolence or insomnia. The patient has difficulty in concentrating on

new work. There may be slight vertigo, neuralgia, ocular and vasomotor disturbances, and in some cases slight albuminuria.

General symptoms and diagnosis: After the sclerotic process is well established the skin becomes harsh, wrinkled, and inelastic. The layer of subcutaneous fat over the chest and extremities is reduced and accumulates upon the abdomen; the muscles lose their tonus and undergo wasting. The local and general symptoms depend on the organs involved and the extent of the process.

Cardiac symptoms and signs: Simple hypertrophy of the left ventricle may occur, with heaving apex, loud aortic second sound with a hard retarded, slow pulse. Consensual right heart hypertrophy is common because of anastomosis between the ventricular muscle fibres or as a result of pulmonary stasis. Hypertrophy is always present when the aorta or splanchnic vessels are sclerosed. In sclerosis of the arteries of the brain, or extremities, the hypertrophy is only slight. The apex sinks downward and to the left in some cases, due to lengthening of the aorta.

Dilatation follows hypertrophy, with heart insufficiency, dyspnoea and hydrothorax. A systolic murmur generally develops at this point. High arterial tension is present in less than half of the cases. Low blood pressure is more common in the arteriosclerotics, than high. The blood pressure may be very high, and even though cardiac weakness develops, the blood pressure may remain as high as 300 m.m. (Systolic). A double impulse is often felt at the apex and is a pathognomonic sign of approaching cardiac weakness. Gallop-rhythm is present quite often and points to renal or coronary disease. The heart muscle may show many changes other than hypertrophy. They are atrophy, fatty degeneration, myofibrosis, myomalacia cordis and heart aneurism.

The aorta usually shows dilatation and there is dullness in the second and third intercostal spaces. A short systolic murmur over the aorta is often present and denotes atheroma. The aortic second sound is then accentuated and metallic.

Renal symptoms and signs: The secretion of urine is increased with high blood pressure and decreased from asystole.

The urine is voided frequently, is pale and of low specific gravity. It contains only small quantities of albumen and solids, and the sediment is small in amount, and contains a few casts. It is like the urine of Interstitial Nephritis. The total is 2,000 to 12,000 c.c. per 24 hours, and the quantitative test for albumen shows two to five grams total in 24 hours. In the morning specimen the albumen is frequently absent.

Urea, uric acid, ammonium, chlorides and phosphates are all decreased! The tests of renal function all show decreased activity.

Cerebral symptoms and signs: Syncope, vertigo, headache, tinnitus transient aphasia or hemiplegia occur but rarely. Brain hemorrhage is practically unknown in the feeble-minded.

Brain atrophy is very common and depressive states follow. The lacunar sclerosis of Grasset and Marie occur rarely. Epileptoid seizures and the Adams-Stokes syndrome occur with relative frequency.

Gastrointestinal symptoms and signs: Arteriosclerotic gastritis, round ulcers, gastrointestinal haemorrhages and intestinal ulceration occur. Spasms of the mesenteric and gastric vessels occur two or three hours after

meals and result in distention and dyspnoea. Proctitis, hemorrhoids and bloody stools are quite common.

In cerebral atheroma the retina is frequently embolized and narrowed.

In the respiratory tract, emphysema and bronchitis are common. Gangrene resulting from endarteritis obliterans is rare and Haynaud's disease is equally rare, considering the number of cases.

As far as the general nutrition is concerned, we distinguish between two types, a plethoric and anemic. In the anemic there is a dusky pallor.

Prognosis: The prognosis in arteriosclerosis is always bad from two standpoints. First, the patient may be carried off at any time from the various complications, such as cardiac paralysis, uremia, angina pectoris, etc. Second, the patient's resistance to other diseases is lowered, and the various diseases of infancy and early childhood have a high mortality in the feeble-minded patients with arteriosclerosis. We have stated that the percentage of arteriosclerosis in the feeble-minded at five years of age is 11.3 and at 30 it is 2.5 per cent. We note, therefore, that 8.5 per cent pass away during the intervening period.

The cerebral accident, as apoplexy, is practically unknown in the feeble-minded, which serves to prove that a well regulated diet and habits forestall this unpleasant end.

When a mitral murmur develops and there appears signs of failing tonicity and contractility, the prognosis is grave.

The arterial tension if it does not pass 200 should cause no alarm. A low blood pressure with slow pulse is less favorable than a high blood pressure and rapid pulse.

Treatment: Prophylaxis concerns the etiologic factors and the patient's mode of living, and in early cases the process may often be arrested.

Hygienic and dietetic treatment: Excitement and overwork are to be avoided, rest in bed and a low diet many times restore health, lower the blood pressure, and revive the heart. Twelve ounces of milk every four hours is the only food allowed for the first week, then carbohydrates, fruits, fats and vegetables, are gradually added. The salt intake is carefully restricted. Soups, gravies, and meat rich in purin bodies are prohibited. Exercise is regulated and consists of the less vigorous forms. Rest in bed longer than sleeping hours is most effective. Daily, prolonged, warm baths are excellent. Hot hand and foot baths reduce peripheral resistance.

Drugs: Potassium iodide is given in 20-grain doses three times a day, 20 days each month, and during the other ten days sodium nitrite in small doses is administered and its effect on the blood pressure noted. In the syphilitic cases mercury is administered by inunction, and arsphenamine is given with caution. Hypertension is pathological, yet a conservative act of nature. Therefore it should not be reduced with drugs, other than saline laxatives, unless it mounts to 200 or over.

Chloral hydrate in seven-grain doses operates well in pain, high tension, insomnia and nervousness.

Rest is the best cardiant, however morphine is required in cardiac asthma, but must be used with caution.

When the heart muscle first weakens, digitalis is indicated unless there is well developed nephritis, in which venesection is superior, ten

ounces of blood being quickly withdrawn in an individual weighing 150 pounds.

Spasms of the larger vessels, like intermittent claudication and spasm of the mesenteries, are treated with liberal doses of the nitrites. Cerebral symptoms are an indication for rest in bed, with full treatment for the disease.

Formication is treated with five grains of calomel and five grains of jalap.

Other symptoms are treated as they arise.

Dr. Kilbourne: "Fools rush in where angels fear to tread." I do not want such a good paper as Dr. Errickson's to be without some words of commendation, at least.

While I have not had much experience with arteriosclerosis among the feeble-minded, I have had some experience with it among the insane. "A man is as old as his arteries," and the man who can go through life and reach a good old age without arterial degeneration has to a large extent selected the right kind of parents. If your parents have lived to a good old age, it is a sign that they have had good, elastic arteries, and you may feel less apprehensive if such is the case.

We are all more or less apprehensive that we shall get old and have a ruptured blood vessel in the brain and be helpless. It worries a lot of us a great deal. I am not worried myself, because when you get a big hemorrhage in the brain, you do not know much about it; and it is useless to worry, anyhow. All you have to do is to be ready to go, that is all there is about it; and you want to live so that you need not be apprehensive of a cerebral hemorrhage, because, as I have said, when it does come you won't know much about it.

Bishop Bu&ch's subject approaches the matter of arteriosclerosis very closely. I do not know whether this is the general view, but I believe that we bring arteriosclerosis upon ourselves largely by overeating; that it is largely a matter of diet and exercise.

The person who eats all he wants to eat and always gets up from the table with his hunger satisfied, and goes to the office and sits down, and goes home and eats some more, and then goes to bed, who never thinks of walking or of exercising, is likely to have arteriosclerosis. He should eat less, walk more, stop riding on the street cars and in automobiles, and walk, exercise.

There is another element which enters this very broad subject of arteriosclerosis. You have often noticed in the newspapers that some old man at 85 has become enamored of some young lady of 20 or 25. I noticed by the papers the other day that a judge had ruled that because an old man admired the young ladies and wanted to marry two or three of them was-not a sign that he was insane. I think it is. The courts do not recognize that condition that comes on with old age, where a man has departed from his usual custom, from his usual condition of mind. A great many estates are dissipated where an old man marries two or three wives when he should be under guardianship. They ought to be like doctors. When a doctor is handed his diploma he ought to be handed a certificate of guardianship at the same time. They all would be a great deal better off if they were treated in that way. Every little while a judge rules that some old.

man is capable of taking care of his estate. The fact is he is not. It is a condition that is hardly ever recognized outside of the medical profession. There may not be a very great departure from the normal mental condition, but there is a departure, and the departure is downward. I think you all will agree with me that there are a lot of those cases that ought to be under guardianship. The estates are dissipated; the old man marries the third or fourth wife when by rights he ought to be buried.

Mrs. H. L. Stark, Member Board of Women Visitors: I believe Dr. Kilbourne said that arteriosclerosis was a matter of heredity; then, again, that it was a matter of diet.

I recall very distinctly of reading a few years ago about a prominent man of Boston—I believe he had been governor of Massachusetts and a member of congress—who died at the age of 50 of arteriosclerosis. No member of his family had ever passed his fiftieth birthday; for 150 years back they had all died of the same trouble.

Dr. Kilbourne: The trouble is his ancestors did not die soon enough.

Dr. Clark: Dr. Errickson in his paper presented one form of arteriosclerosis which was to be expected in the class of subjects on which he studied it, the feeble-minded. It is unfortunate that a child does not select its parents; these poor little ones did not select theirs, but suffered for their physical sins.

I was much interested in the Doctor's paper, and very much surprised at some of his statistics as to the extreme youth of some of those patients showing arteriosclerosis.

I have felt that arteriosclerosis is one form of disease, or condition, which could be easily prevented. In my opinion the excessive use of food causes more deaths than the excessive use of liquors, but you will find that deaths from arteriosclerosis, ruptured arteries, will go on just the same; the percentage will not be diminished to the per cent you might think it would be by cutting out liquors. Intemperance in eating is just as much a sin as intemperance in drinking. Professional men especially—undoubtedly 75 per cent of them—eat too much for the amount of exercise they take.

Arteriosclerosis means old age—they do not allow us to put that term, old age, in the death certificate nowadays—it means we have used up our bank 'account of health, whether we are 40, 60, 75, or 97 years of age. At the Soldiers' Home we have two men side by side, one 95 and the other 97, both active mentally and fairly well physically. I know men of 40 years of age whose arteries are not so good as the arteries of those men of 95 and 97.

When you say arteriosclerosis is a matter of heredity, it means that a physical sin was committed; "the sins of the father are visited upon the children."

We can do a great deal to help ourselves. I do not believe the Lord helps us very much unless we try to help ourselves. I do not believe He interferes very much with what concerns us until we have done our best; then He may take a hand.

James C. Matchitt, Secretary State Board of Visitors: I have always understood, in my mere ignorance, that blood pressure was a barometer

as to the condition of the arteries. Am I to understand from Dr. Errickson's paper that this is not so?

Dr. Errickson: As I stated in the paper, there is more low blood pressure in arteriosclerosis among the feeble-minded than high blood pressure. I do not know the exact figures, however, in all types of people, but if I remember correctly you will find only slightly over half with high blood pressure. High blood pressure is better than low. You can readily see why. Nature makes the heart pump more strongly, so to speak, to put out the same amount of blood so that all parts of the body may be fed and all parts of the body may be properly heated.

A blood pressure of 200 is not to be feared. Many people with high blood pressure fear they are going to drop dead from apoplexy. If the blood pressure goes up very much over 200, there is some danger, but people have lived with a pressure of 300. We read of a man's making a speech before a body of people and dropping dead on the stage. That is always due to a pressure around 300 or so. In their excitement their pressure goes up, say 80 points, and the arteries cannot hold. But a pressure of 200 is not to be feared and should not be reduced; it should be let alone.

The Chairman: Do you mean to say, Doctor, that a blood pressure of 200 is not dangerous?

Dr. Errickson: It is not dangerous, irrespective of age. The arteries are so thickened that they can stand it.

We figure blood pressure this way: 120 at the age of 25; add a point for every year; so that a man along 50 years of age would have a normal blood pressure of 145. A pressure of 200 is only 55 more points.

Mrs. Stark: I read everything Dr. Brady writes in the newspaper; I think he is very fine; and he says if you will turn six somersaults every day you will never die of arteriosclerosis.