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Island College Hospital, Brooklyn; Medical
Superintendent of the Kings County
Insane Asylum.

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RAYNAUD'S DISEASE.*

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COUNTY INSANE ASYLUM.

THE condition to which I invite your attention is one of considerable interest, and only within recent years has the attention of physicians been directed to it.

For the purpose of elucidating the clinical history of this condition, I shall give briefly the histories and description of some cases. The marked features in these cases are the localized blanching of the fingers or toes, nose, or ears, and in some cases localized gangrene of these parts:

CASE I (Personal).—A woman, aged fifty, admitted to the asylum with melancholia, delusions of poisoning, etc., attempts at injury to herself, refusal of food, and resistance to every effort made to do anything for her. One morning when visiting her I picked up her hand to examine her pulse, and was surprised to find the index and middle fingers, up to the joint of the second phalanx, extremely pallid and death-like. When felt, they were intensely cold. This condition of pallor lasted some time, then passed away, and I never observed it again in the patient. It was impossible to learn if this condition had ever occurred before to her.

* Read before the Brooklyn Pathological Society, April 22, 1886.

CASE II (Personal).—M. S., aged fifty-one, seen first December 12, 1882, having been sent to my clinic for nervous diseases, in the Brooklyn Eye and Ear Hospital, by Dr. Alexander Clark. Patient is of spare build, but healthy-looking. Has enjoyed good health in former years. Eight months ago began to have some trouble with right shoulder; could not move it as well as formerly, and, when she did move it to any great extent, it pained her. About this time she began to notice that the little and ring fingers of the left hand would suddenly become cold and white, lasting about half an hour, and then pass away. At first she had these attacks about once a week; at present she has them every day.

While being examined she had an attack. The entire little finger, and the next finger up to the joint of the second phalanx, became suddenly intensely pale and death-like; they were cold to the touch, and the patient said they felt cold. This pallor lasted about half an hour; it was followed by a feeling of warmth, and, as the patient said, one could almost see the blood as it returned to the fingers; they grew red and warm.

CASE III (Dr. T. A. McBride, in a paper before the New York Neurological Society, April 1, 1878; partially reported in New York "Medical Record," April 11, 1878).—Man, aged thirty-two, of neurotic constitution. Certain parts of the index and middle fingers of both hands, also of end of ring finger of right hand, at irregular intervals and at varying periods, became cold, of a dead-white paleness, numb, and stiff, with some loss of sensibility, and were moderately painful. These symptoms were replaced by a dusky, often purplish-red color of the same parts, accompanied by a sensation as of having been stung by nettles, and soon after the affected portion of the fingers regained their normal appearance. The phenomena appeared to occur independently, occurring when the patient was otherwise healthy as well as when sick. No similar phenomena had been observed elsewhere in the body.

CASE IV (Dr. Barlow, "Clinical Society Transactions," April 27, 1883).—In October, 1882, there appeared in the out-patient room a little girl aged five. Within a short time the whole of right foot and ankle, and the leg for a distance of three or four

inches upward, had become cold and of a nearly uniform grayish-blue color. The child whimpered a little with pain in the foot, and did not like it to be handled much. Just below both elbows, on the dorsal surface of the forearm, there was an area of perhaps three inches in length, of ill-defined blueness and coldness. This slight blue area was more marked on the right than on the left side. The child had no cardiac disease. It was admitted into the hospital ward of Dr. Fox, and this condition passed off in an hour or two, and the next day the child seemed perfectly well.

The second day after, at 3.30 P. M., while sitting in the ward, she had another attack, which Dr. Barlow saw. There was slight blueness and coldness in the left foot and ankle. The child whimpered a little, but was able to walk across the ward with a slight limp; the foot became natural again within less than half an hour, and she had no further trouble. From a history obtained subsequently, it was learned that she was nursed nearly two years, was late in teething, and was probably rickety to some extent. She had not suffered from any of the acute specific diseases, and there had been nothing special in her history until February, 1881, when she was about three years and a half old. It was very cold weather, and the child was out of doors, but carried in somebody's arms. When brought into the house she complained of cold feet, and vomited some watery stuff. Her feet were quite blue, and the blueness extended for a short distance above the ankles. The blueness lasted from five o'clock until midnight. Next day she was all right. Seven months passed before she had another attack, and this was in the month of September. The blueness lasted two hours. She had another attack in a week's time, and several other attacks during the winter. Since that time the attacks have always been confined to the cold weather. The attacks occur mostly in the afternoons; never at night. The duration of the longest attack has been seven hours; but usually the attacks pass off in less than an hour. Latterly the elbows have been affected, but the ears and nose never have been.

CASE V (Dr. Barlow, "Clinical Society Transactions," 1883).
—A girl, aged five, of healthy parentage, had been nursed twelve

months, and, with the exception of what was called "congestion of the brain from teething" at sixteen months, had been a healthy child. She had had whooping-cough and measles when one year old; never had ague. In September, 1881, being then three years and a half old, she had her first attack of coldness and blueness, with pain affecting one foot, and lasting for several hours. Very soon after this attack commenced, the child passed some very dark urine. She had another similar attack in a few days, and then repeated attacks during the winter until April, 1882. There were sometimes two or three during the week; the duration was not generally more than three hours. The attacks occurred most commonly at midday; the pain always preceded the coldness and blueness. The child did not pass dark urine with every attack, and never more than once with each attack. During the first winter, along with these symptoms, she complained on some occasions of pain in her stomach, and in one attack the left hand became blue and cold up to the wrists. The last attack of the first winter was on May 6th. She was then free until September, 1882. Dr. Barlow saw her in February, 1883. Up to that time she had sometimes gone fourteen days without an attack, and at other times she had had two in a day.

March 15th.—For about eight days she has had an attack daily in left foot, but on some days in both.

CASE VI (Dr. T. C. Fox, "Clinical Society Transactions," 1885).—Mrs. S., aged forty-one; family history good; no evidence of any neurosis; never had rheumatism or any special illness; married at twenty-seven, and had six children, including twins at last confinement; no miscarriages. Dates her illness from June, ten years ago, when she moved into a damp house. Her fingers then began to grow at frequent intervals white and dead, all of them simultaneously on both hands, "like wax," as she expressed it, and they pained her excessively. Gradually her feet also became involved, and up to the present time the recurrences have been getting more frequent. She is now a woman of spare habit, and with an anxious face and intensely nervous temperament. She sleeps poorly, and has had two attacks of hysteria. Heart and other organs healthy. There is

no diabetes. When seen in February the condition of the fingers might easily have been mistaken for scleroderma; all of the fingers were icy cold, of a slightly blue tinge, fusiform in shape, the skin over them shining and sunken; the nails were variously affected, and some of the bones atrophied. The history, however, made the nature of the malady clear. On subsequent occasions I have seen all the fingers slightly swollen and of various shades of lividity up to the metacarpo-phalangeal joints. Occasionally the asphyxiated condition of one of the fingers will lead to the formation of a blood-blisters; the contents subsequently become puriform, and, on the rupture of the bullæ, an ulcerated surface is left, which is very slow to heal. At the time of writing, the left ring finger is ulcerated at the end and under the nail. In the toes the disease is less severely felt, but their ends are somewhat blue and cold. The tip of the nose is rather blue. The influence of cold is very marked. Her ears and nose grow blue and cold directly she goes out of doors; her hands and feet get intensely livid, with an "agony of pain." She also states that her extremities grow blue "in a second" if she is startled by a sudden knock at the door or any unusual occurrence, and her heart "feels as if in a vise."

Her pulse is thready and compressible. There has been no hæmoglobinuria, and her blood appears to be normal.

CASE VII (Dr. T. C. Fox).—Man, aged fifty-one, of regular life. He was a stout, florid-complexioned man of remarkably good physique, but yellow conjunctiva; complained of feeling weak. He applied to Dr. Fox on account of two oval, symmetrical, gangrenous sores, of about the size of a half-crown, one at the junction of the middle and lower thirds of each shin. These sores were covered with an adherent black eschar, and they had originated suddenly in blood-blisters. There were also a few pustules scattered around. His feet and hands were cold and his pulse was soft and weak, but, with one exception, Dr. Fox could find no other diseased condition. He was suffering from marked diabetes, but was not aware of it. The sores were very obstinate to heal, and on March 28th another congestive patch appeared on right shin, which seemed to threaten gangrene. On January 2, 1884, he again applied to Dr. Fox, who

says he did not recognize that the man was suffering from Raynaud's disease until January 5th, when his left great toe became suddenly black and swollen and intensely painful. Inquiry now developed the fact that for years he had suffered from sudden blanching and numbness of the digits. He had formerly been a door-porter in a store, and exposed to draughts.

CASE VIII (Dr. Charles K. Mills, "American Journal of the Med. Sciences," 1878, p. 431).—E. J., aged thirty-two, single, mill-hand. Mother died of phthisis; well until nineteen years old, except always suffering from excessive sweating of hands and feet. At nineteen she took a severe cold, from which she suffered several weeks. One morning in the early autumn, on her way to work, the little finger of her left hand, as far as the second joint, suddenly became cold, white, and numb. After this, whenever exposed to cold, one or more fingers would present this appearance. Dr. Mills found a mitral presystolic murmur; the lungs showed impaired percussion resonance and vesicular murmur, and there was a cavity of considerable size in the right apex. Six months after her first attack her little finger was first affected. A swelling formed at the point of the thumb as if a splinter were in it; it suppurated and a small abscess formed, and was a long time in healing; from time to time thereafter small abscesses formed on ends of fingers.

CASE IX (Personal).—M. D., aged forty, an insane woman, confined in the Kings County Insane Asylum. Patient has always been of a disagreeable, fault-finding disposition, and of a very low order of intelligence, which her physiognomy also indicates. She has a paternal aunt insane. Patient has had delusions of poisoning, with consequent refusal of food; made many attempts at suicide; has often been violent, owing to her delusions of persecution. In August, 1883, she became quite agitated and remained in this condition many months, talking in a loud voice, attacking all who came near her; in constant motion; never sat down. In September it was observed that she had a small gangrenous spot on the end of the middle finger of the left hand; she resisted when an attempt was made to look at it, but was held; it was then found that she had complete gangrene of the end of that finger, and each finger on that hand had,

on each side of the nail, a small black gangrenous spot. The gangrene of the first phalanx of the middle finger in the next week extended so as to involve the entire phalanx; it was black, and evidently quite dead and sloughing. The small spots on the other fingers had grown a little larger. It was now found that the right hand had also begun to have the same small black spots on every finger on each side of the nail; the gangrenous spots on this hand were not larger than the head of a large pin. Her feet were examined, but no similar condition was found, although they were very much swollen. Her urine showed nothing abnormal. Her heart could not be examined, as she had to be held and fought constantly when approached, but the record shows that, on her admission, her heart was normal. In the course of several weeks the black spots on the right hand disappeared without ulceration, but on the left hand the middle finger ulcerated and sloughing took place.

At the present time the finger is not yet well; the ulcerated surface is still not healed; she will not allow any dressing to remain on it.

CASE X (Dr. Southey, "Clinical Soc. Trans.," 1883).—F. N., aged nine, a large-headed, fair-complexioned, light-haired child. He enjoyed good health until the autumn of 1881, when he was attacked with some feverish illness, attended by pain in his limbs, which was believed to be rheumatism. On admission, he was greatly emaciated, and his hair was falling off in large quantities. He was in a very nervous and excitable condition, crying whenever an attempt was made to examine him, singing snatches of songs and hymns in a loud tone; by day he slept a good deal, but as evening approached he became very noisy, singing and screaming alternately. He used to pull handfuls of hair off his head. Appetite bad; tongue clean and moist; pulse, 148; no cardiac murmur, no physical signs of lung disease; urine presented no abnormality. The single noticeable fact observed was the localized gangrene of the tip of his right index finger and the coldness of his extremities. The gangrene of the right forefinger crept slowly and steadily onward, and, in a few days, involved the entire terminal phalanx. On December 2d the thumb and second finger of the right hand were

observed to be red, swollen, throbbing, and hot, just like chilblains, and there was a small purple patch upon the helix of his left ear, evidently a blood stasis. On December 4th this patch was still apparent, although smaller, but the third finger was assailed like the thumb, fore, and second fingers, and all four looked extremely livid and red, while redness and swelling of the thumb of the left hand were also present. On December 5th a spot exactly similar to that upon his ear of local blood stasis, threatening gangrene, appeared upon the extreme tip of his nose, and the tip of the right middle finger became quite black. During the ten days that the boy had been under observation his temperature was found in the morning, before 10 A. M., to be usually normal or only slightly elevated, 99.4° ; in the afternoons and evenings it rose to from 101° to 102.8° .

On December 19th the tips of all the fingers of his right hand were gangrenous, and the flesh of the fingers below the gangrened ends was livid and swollen.

On the left hand, the thumb, index, and little fingers were extremely dusky.

In the course of the ensuing week the gangrene made rapid progress, spreading from the tips of all the fingers of the right hand backward and centripetally. On December 29th there were troublesome cough, broncho-pneumonic sputum, and tubular breathing over the lungs posteriorly. In the first week of January his general condition was improved; lines of demarkation between dead and living tissue were defined. Suppuration commenced. The cough improved, and he began to gain a little flesh.

On January 9th the urine was found to be acid, 1.012 specific gravity, and containing both blood-cells and albumin. It attracted attention by its dark color.

For several subsequent days it was natural-colored and of specific gravity varying between 1.010 and 1.025. He presented a true intermittent hæmaturia, provoked apparently by impressions of external cold on the surface of his body. Thus, after exposure and being washed, he would pass a specimen of urine

containing blood, whereas urine passed a few hours later contained a mere trace or none.

During the latter part of January, February, and March, blood was more often absent than present in the urine, and this only very temporarily.

Throughout January suppuration and separation of the gangrened digits was taking place.

His temperature ranged between 97.4° and 101.4° ; it always rose in the afternoon and sank in the morning. At the beginning of August he was able to walk about again.

Most of these patients presented an evident abnormal irritability of the nervous system, if not positive nervous disorder.

Dr. McBride's patient had anterior spinal paralysis, from which he recovered.

One of Dr. Barlow's patients was said to have had "congestion of the brain from teething."

One of Dr. Fox's patients eventually became a nervous hysterical woman.

Dr. Southey's patient was evidently hydrocephalic, and probably insane, when under his observation.

One of Dr. Fox's patients had diabetes with an evident neuropathic constitution to begin with. My three cases presented a neuropathic history. The exciting causes of the disease appear to be exposure to cold, most of the cases being very much worse in the cold weather.

Emotional disturbances, fright, etc., appear also to be excitants.

Many of the cases are associated with intermittent hæmaturia, which is probably due to the same causes as the gangrene and "dead fingers."

Some of the cases are also associated with diabetes.

The symmetrical distribution of the gangrene, and also

of the blanched fingers, is remarkable, and was especially insisted upon by Raynaud.

Although a large number of the cases are symmetrical, especially those leading to gangrene, many are reported in which only one extremity is involved. This symmetry in the attack is seen even in cases in which the ears are the seat of the gangrene.

According to McBride, the development of dry gangrene from *digiti mortui* is rare.

According to Raynaud, the condition usually preceded what he called local asphyxia, which might be acute or chronic. If acute, it might go on without any disturbance of nutrition, but more commonly gangrene, more or less localized, occurred, and sloughs of considerable size might form, or, what seemed more common, after a small amount of gangrene had occurred, the local asphyxia disappeared and cicatrization followed.

In the chronic form, lasting some months, there might be localized gangrene followed by cicatrization, as in the acute, but more commonly there were manifested other alterations in the nutrition of the parts, so that the skin became much thickened and indurated.

Dr. Colcott Fox thinks that the changes left after this disease may lead to its being confounded with scleroderma. It can, however, only be so confounded if a previous history is not obtained. Dr. Fox also remarks that in two unquestionable cases of scleroderma under his observation, in which the hands were involved, both women had long been subject to "dead fingers," and one of them continued to have mild attacks of asphyxia of the fingers after the onset of scleroderma.

It appears also that Vidal thinks there is an intimate connection between scleroderma and Raynaud's disease, and

Brochin points out that the two diseases can be united in the same patient.

Dr. Allan McLane Hamilton, in an article on this subject, sums up by saying that it is characterized by—

1. Local blanching, lasting two or three weeks, or coming on in intervals of several weeks and lasting a few hours each time.

2. Sensation and motion unimpaired.

3. Temperature of affected members lowered.

4. Parts affected—hands.

Subsequently reported cases, however, have shown that we may have slightly elevated temperature as well as lowered, and the hands, feet, ears, nose, and even the body, may be the seat of these disorders.

A marked characteristic of these symmetrical gangrenes of the extremities is the complete absence of all causes of obstruction in the arteries. How, then, is this interruption to the flow of blood into the parts to be explained? Raynaud thinks that it is the result of a spasm of the small blood-vessels under the influence of an irritation to the vaso-motors of these vessels, and usually through a reflex act.

Raynaud thought that, in women who were the subjects of this disease, the pelvic organs might be the starting-point of the irritation, which was reflected upon the vaso-motors of one or more of the extremities, for some cases of localized asphyxia were observed at the time of menstruation. Many cases, however, appear to have had their primary seat of irritation in the extremities themselves—such cases as were produced by cold, for instance.

It appears probable that, whenever the vascular disorders are symmetrical or wide-spread, the monarchical vaso-motor center in the medulla oblongata may be involved, and one might be inclined to think that in these cases occurring

in association with diabetes, this monarchical vaso-motor center was involved, and thus caused the localized spasms at the extremities, etc.

Dr. T. A. McBride also explains the condition as being due to reflex vaso-motor spasm. Vulpian does not fully accept Raynaud's view as to menstruation producing the starting-point from which reflexly the vaso-motors of an extremity are affected; he does not think this necessary to explain these cases, for he says at the menstrual period, in many persons, the nervous system is already often in a state of over-excitability; the least impression on the skin is apt to give rise to phenomena out of all proportion to the excitation.

More recently Raynaud has expressed the view that in these cases there is an exaggeration of the excito-motor power of the central parts of the spinal cord presiding over the vascular innervation.

Dr. Hamilton also looked upon this condition as due to over-irritation of local sympathetic vaso-motor filaments.

One who has the occasion to watch the approach of the blanching of the fingers in one of these cases at once adopts the view of its being due to vaso-motor spasm.

I have been asked to point out the treatment to be adopted in such cases. I must do so in the most general manner possible; it has been various, almost every writer adopting a different plan.

Galvanism, locally, also to the spine, has been quite generally used. Raynaud first advised it. Bromide of potassium, tonics in general, Fowler's solution, potassium iodide, quinine, morphine, internally, when the patient has suffered pain, and the local application of chloroform, have also been used for the same purpose; light bandaging of the part has also appeared to relieve this pain. In cases complicated with diabetes, scleroderma, etc., the treatment indicated is such as is carried out in those conditions.

Other than those cases of Dr. Allan McLane Hamilton, Dr. T. A. McBride, and Dr. C. K. Mills, a case has been reported by Dr. S. C. Clark, of Clayton, N. Y. ("Med. Record," 1885, vol. i, p. 122).

Dr. C. L. Dana, in an article on "Acro-Neurosis," reports two cases ("Med. Record," 1885, vol. ii, p. 57). Dr. Dana, at the end of his article, gives an extended bibliography, and to that I refer those interested for cases other than those mentioned in this brief essay.



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