absent in four cases, in one of which shooting pains were the patient's chief complaint. In another case shooting pains with blurred sight and marked constipation were noted, there being no record of the condition of the reflexes. Atrophy, weakness and numbness of the left arm and leg, with tremor of the left hand, was a feature of one case. A spastic gait with increased reflexes and clonus was noted in another. Finally in two cases, both of them women, a total paralysis of all extremities, with loss of control of sphincters and complete helplessness, came on towards the end of the disease.

Aphasic seizures were noted in two cases — in one case occurring only once and lasting a few hours, and in the other repeated three times and preceded by an aura like that of epilepsy. This same case had once complete and sudden coma for two hours, the details of which were not known as it occurred at the patient's home. In one case there came on while in the hospital a sudden inability to swallow, the face being drawn to one side and a slight paresis of the arm and leg on the other, which gradually passed away in the course of the next three days.

Mental Symptoms were chiefly confined to dulness increasing gradually into a stupid, semi-comatose condition which occurred during the last few days of life in most of the cases. This was preceded or accompanied by delirium (especially at night) in four cases; in one, very active noisy delirium. In two cases there were delusions and hallucinations of sight and hearing for months before death.

Death was gradual and slow in all the fully recorded cases except one, of which further mention will be made later. It is worth noting that of the 17 female cases nine, or over one-half, showed symptoms referable to lesions of the brain, cord, or peripheral nerves, while of the 33 male only eleven, or one-third, showed such symptoms.

Physical Examination. — The color of the skin and mucous membranes has already been remarked on. A notable smoothness of the surface of the tongue is recorded in five cases. The gums bled easily in 14 cases and possibly in some of the rest in which no record was made on this point. In one case the tissues of the mouth were also in a very unhealthy condition, and repeatedly broke down in small ulcerating patches.

Undulation or visible pulsation of vessels in the neck is recorded in all of the twelve cases in which there is any record at all upon the subject. The absence of emaciation makes this symptom worthy of note.

The condition of the *pulse* is recorded in only six cases, in three of which the note is "full and soft" while in the others there is mention of the resemblance to the Corrigan or water-hammer quality. In two of these cases a short sharp sound in the peripheral arteries was observed, although there was not thought to be any valvular lesion. In one a capillary pulse was observed in the lip.

The *heart* was examined in all cases. In 35 there is a record of soft systolic murmurs, loudest at the base but heard all over the cardiac area and presumably "hemic." In two cases a double murmur at the apex was observed, with also a "harsh" murmur at the base in one. In one case the systolic murmur was heard also in the left axilla and back. The absence of enlargement is noted in all but two cases,

where there was some increase in the area of dulness both to right and left.

The *lungs* showed the moist râles of passive congestion in five cases for a greater or less period. Hydrothorax occurred in three, as has been mentioned. The liver came two fingers' breadth below the ribs in five cases, in two of which its area of dulness likewise extended up to the fourth rib. In one case enlargement upward to the fourth rib is noted without enlargement downward, and in one case a considerable and palpable enlargement of the liver was recorded without further detail. Total, seven cases of enlargement out of 44 in which this point is noted.

Enlargement of the *spleen* was observed in five cases, the organ being palpable in three of them; the area of dulness in the fourth case was six inches by four inches, and "enlarged" in the other. In one of the cases where it was palpated, it reached one and one-half inches below the ribs, in another three and one-half.

Tenderness over the *long bones* was observed in only six cases and noted as absent in 35.

The notable *preservation of the subcutaneous fat* is specially recorded in 40 cases. More or less emaciation in seven, no record in the others.

Urine was examined in all cases. Its color was normal or pale in all but three cases, and in these only a single examination is recorded so that we do not know whether the high was permanent or transitory. The specific gravity was low, averaging 1.015. Albumin, sugar and casts were absent in all but two cases and in these two, both of whom were over fifty years old, there was nothing more than is the rule in well people of that age. Pathological urobilin was specially looked for in three cases and found absent. The statement of Hunter that a high-colored or dark urine is a frequent symptom is not borne out by these cases.

The eyes were examined in eight cases, and retinal hemorrhages found in five. One patient said he had been entirely blind for twenty seconds on one occasion. Another complained of a reddish mist over everything he saw. In the other cases no symptoms referable to the eyes are recorded.

Fever was present in all of the 40 cases in which observation on this point was noted, 99° to 100° in 14, 100° to 101° in 13, and irregular in the others, seldom reaching over 103°. Chills, with chattering teeth, sharp rise of temperature and sweating were present without known cause in three cases — a few times in the course of each.

(To be continued.)

THE PULMONARY INVALID IN COLORADO.¹

BY CARROLL E. EDSON, A.M., M.D.,
Physician to Out-Patients, Boston City Hospital.

CERTAIN features in the life of a pulmonary invalid in Colorado have impressed themselves deeply upon me during a year and a half's residence in that State. They are non-statistical, every-day facts. They can be appreciated fully only by actual experience or observation; but they are of such direct and vital importance to the well-being of the invalid that I wish to bring them to your careful attention.

¹ Read at the Annual Meeting of the Massachusetts Medical Society, June 10, 1896, and recommended for publication by the Society.

The meteorological statistics of Colorado climate which you are acquainted with are chiefly those of Denver and Colorado Springs; but please remember that Colorado is nearly four hundred miles long by two hundred and eighty miles wide, and varies in altitude from three thousand to fourteen thousand feet above sea level. Short distances, particularly in the invalid belt, along the eastern slope of the mountains from Pueblo to Fort Collins, make marked difference in the weather conditions. This is especially so about Colorado Springs, where the isolated mass of Pike's Peak acts as a storm centre and meteorologic eccentric of considerable moment. Arapahoe County, of which Denver is the seat, is alone as large as Massachusetts and of about the same shape. Parts of the State especially attractive to new-comers because of game or gold-mines, are entirely unsuitable for an invalid. Do not then think, from your knowledge of general sun and humidity statistics, that it suffices to send a patient simply to Colorado, to settle where he may please.

The two factors most essential to a successful use of Colorado climate for pulmonary tuberculosis are these: early diagnosis, with prompt exile; and, especially, medical control of the case from the start in the new climate. The importance of the first, and the great advantage of climatic therapeutics in the early stages of pulmonary phthisis, the malarial stage, if I may so call it—of debility, slight febrile movement, a quick pulse and few or dubious signs on chest examination—cannot be insisted upon too strongly. It is not my purpose, however, to discuss here the question of climate or altitude. I assume throughout this paper that the invalid has been sent to Colorado as the place best suited for his case; and by *invalid* I mean a person sent to Colorado because of tubercular disease, no matter how slight or localized the invasion, or how little impaired his general health.

Let me only say that Colorado as a last resort, when the patient has gone steadily from bad to worse in Florida or Saranac or Asheville, is very different from Colorado at the start. As Fisk says: "There should be no more delay in the wise selection of climate than in the early diagnosis of the disease. Delay is dangerous. Tentative methods are not to be tolerated. The patient is entitled to the best that medical experience can offer."

What I wish to call particularly to your attention is the need of proper control of the patient while in Colorado. Hope alone, even *spes phthisica*, or air, even that of Colorado, if misused, will not cure tuberculosis. Many patients, arrived in Colorado, act, sometimes it must be said under advice from physicians at home, as if the end were gained and they had no more responsibility. In reality the fight has but begun, and it is a fight to the finish with the deadliest foe man has. It lasts a man as long as he lives, and is won not by some great sacrifice, even the going West, but is gained only by constant unceasing watchfulness of little things. "Every impairment of digestive power, every decline in muscular vigor, every breath of foul air breathed is a point lost in the fight in which every item, however apparently trivial, tells in the long run."

A change of climate, with no attention paid to change from confined, unhygienic occupation and injurious habits, to a proper out-door existence, is a game but half and poorly played. Proper housing

and abundant nourishing food are as essential in Colorado as in New England, and require local knowledge and careful search to find.

The city of Denver itself is often smoky, and a city anywhere is not the place for a pulmonary invalid to live in. The suburbs of Denver, however, to the east, south-east or west, are so situated in reference to land configuration and wind currents as to be entirely free from smoke, and offer as clear an atmosphere as that of Colorado Springs. The elevation is a thousand feet less than the Springs and much more agreeable to many persons. I found, myself, that although I was not troubled by the altitude at the Springs, a return to Denver gave me an immediate sense of greater energy and well-being.

Such places as Montclair, University Park, Petersburg or Berkeley are admirably suited for invalids, and are all within the street-car service. Living in Denver is less expensive than at Colorado Springs.

Many places in Colorado, and especially some of the newly recommended towns in Arizona and New Mexico, while excellently adapted atmospherically, are absolutely unfit for an invalid by the impossibility of procuring proper food. Ordinary ranch-life, with its changeless diet of soda biscuit and bacon is undesirable for a patient who needs abundant, easily obtained nutrition. A strong man can go with advantage into the wilds of the White River country after large game, but the hardship and rough diet of the trip will undo an invalid's winter gain. I have seen more than one patient seriously and permanently set back by such a summer's outing.

Let me impress most deeply upon you that an outdoor life in Colorado does not necessitate roughing it, and for the patient with phthisis should not include it, no matter how slight the invasion or apparently vigorous his condition. You do not realize, perhaps, how often patients, particularly incipient cases, are sent West with the remark by the physician here, "Oh! live out of doors; have a gun; live in the saddle. So long as you gain in weight and are feeling stronger, you need not see a doctor." So they do not, till a longer ride than usual, or an exposure to a Colorado wind, with its penetrating power of tiring you out, puts a stop to their improvement and starts them "down hill." The golden opportunity for the invalid in Colorado is the start and the keeping it.

The first response of the patient to the new climate is often astonishingly quick. There is a quality in the dry, warm, gloriously sunny air which seems with each breath to efface that sense of hopeless tire so common in incipient cases. It is not uncommon to see patients gain two pounds the first week in Denver and, *under proper regimen*, to continue at that rate for a month or more. In my own case, if you will pardon a personal allusion, there was a gain of fourteen pounds in the first six weeks and an almost entire cessation of cough in the first three. With the gain in weight comes a similar and often greater gain in nervous energy. The sun and wind soon cover the pale cheek with the Colorado bronze. The patient looks and feels like a new person.

It is needless to say that the repair of invaded tissue does not keep pace with this general gain. The plump, bronzed face is not an index of the condition of the chest. It is difficult to make the invalid new-comer realize this and feel the importance of not jeopardizing the splendid start. It is the reward of

inactivity and is forfeited by overdoing. Once lost, experience shows that the climate is chary of a second gift where her first proffer of health is neglected or misused.

Out-door life, *without exercise*, is the secret of success during an invalid's early months in Colorado. The conditions of air and sun in Colorado are such as to make an out-door existence of continued inactivity possible, in a way hard to conceive here in New England.

A knowledge of local surroundings and care in the selection of a dwelling-place can make such a life possible and pleasant. A veranda open to the south and sheltered from the wind by wall or canvas screen is as important an item to secure, when house-hunting, as a well-ventilated, warmed sleeping room. It is even more so, for the patient is to spend the larger part of his time out-doors. An ideal arrangement is a recessed loggia above the ground open to the south, and so sheltered always from the wind, but giving a wide view over the plains to Pike's Peak and that unsurpassed stretch of two hundred miles of mountain range. In such a nook an invalid can sit even in the shortest cold days of winter, at least seven hours every day in clear, dry air where every breath is one of benefit.

Exercise at first should be absolutely forbidden. The elevation alone causes sufficient pulmonary work. There is chest expansion gained while the patient is wholly still. After a few weeks of quiet gain, exercise may be begun by short walks, beginning with an eighth or quarter of a mile, a distance which seems especially ridiculous in the clear air of Colorado, where objects twenty miles away do not look five. Keeping a close watch for slight rise in temperature, or digestive fatigue, the distance walked may be gradually increased. An excellent change and one agreeable to the patient, as it allows him to get farther from home and perchance out of sight of his starting-point, is driving, not in a high jolting trap, as is too often seen, but in a buggy with an easy-gaited horse, so that the patient has no drag upon his chest and arms from tight reining. From a short drive at first, the invalid can gradually come to spending the whole day in jogging about over the plains. Horseback riding is to be long deferred and most cautiously begun. It has proved a direful cause of hemorrhage or of set-back. It is difficult to make the invalid wait patiently for this, the most prejudged and attractive feature of his western life. The objection to horseback exercise applies with double force to bicycling.

This continued quietness is not the manner of life pictured to most patients on going to Colorado to regain their health, but it is the only one which will be without serious risk.

Let me now call your attention to a few details which directly affect the daily life of the invalid in Colorado.

The climate is very uniform by monthly averages, but the weather from day to day is not always at the mean. Changes from hot to cold are as abrupt and marked as with us. There is not, of course, the damp rawness of our eastern coast, but the contrast between sun and shade is more decided. I have, myself, seen in February two thermometers on my veranda, one in the sun registering 90° F., and the other not six feet off, in the shade, at 45°. The clear, dry air holds little heat, and the warmth is all in the sunshine. A

thin, cirrus cloud, no more than is grateful to the eyes, will take all the warmth from the air and remind you that after all it is mid-winter.

The open cars run all winter, and there are but few days when an invalid cannot ride in them. He should always have a travelling rug to throw across the knees. I have ridden seven miles in an open car at eight o'clock in the evening in February without discomfort; but there is no time when a patient should go far from home without a wrap, even in warm mid-day. The wind comes suddenly and strong from cloudless skies, and many days, though warm and sunny, are far too windy for an invalid to walk or ride. While the wind may last but a short time, it rises suddenly, and the exposure in reaching home may be great. The dust storms are less frequent, but more trying.

The battle against tuberculosis is one of detailed watchfulness. The lack of care which the average invalid in Colorado shows for the important little things is most surprising.

To have a few friends in for tea of an afternoon will seem to you a harmless diversion. Here is the picture as you see it in Colorado Springs. At four o'clock, when the western sun is streaming warm and bright across the mesa, the patient leaves the open air of the veranda and spends the next two hours in her room with six or a dozen friends. The air becomes warm and close, and the energy gained by the day out-doors is soon spent. The dry and the moist cough, not heard when the guests first arrive, begin later in the hour and soon become an integral part of the hum of conversation. Nature sends her flush of protest to the cheeks. Two hours of glorious possibility have been lost. They have been spent in-doors instead of out, and in-doors under bad conditions.

Young men sent to Colorado should be made before they start to feel the seriousness of the fight ahead of them and the necessity for simple living. The West is open-hearted, cordial and essentially a man's country. Club life is offered freely and may have proper use, but for an invalid to take his afternoon's rest from a morning's over-fatigue at golf or coyote coursing, upon the couch in the smoking-room of never so charming a club, is not conducive to his best recovery. Piquet and poker are excitants, but fresh air and early hours are better tonics for tuberculosis. The road to health does not lead in the way of dancing, dinner and theatre-parties. There can be no neutrality in the fight and nothing that does not count; whatever is not directly for recovery is against it.

I put this earnestly, but the recovery of health from tuberculosis is not a pastime. As Fisk says, "It is a hard business, requiring unremitting attention, constant daily care and a stout heart." The timely courage and restraining word which can come with effect from the physician only when he is in close touch with his patient, are of untold worth. From the few details even which I have called to your attention it will be obvious to you that we here cannot direct our patients out in Colorado. Do not then prejudice a quick and sympathetic accord between your patient and his new doctor by careless and erroneous speech about his new western life. Not for him are "the wild joys of living . . . the hunt of the bear." His proper conduct is a quiet, well-nourished out-door life under a physician's control. Our duty in the East, if we are to do it to the full towards the patients we send to Colorado, is:

To make earlier diagnosis.

To send our patient away at once while his chance for full recovery is best.

To send him not simply to Colorado, but to a *physician* in Colorado, unprejudiced as to manner of life, admonished to confide and obey.

Clinical Department.

A FEAT OF INTESTINAL PERISTALSIS.¹

BY EDWARD C. RUNGE, M.D.,
Superintendent St. Louis Insane Asylum, St. Louis, Mo.

J. D., age fifty-nine, machinist, was admitted to the asylum on October 27, 1893, by order of the St. Louis Criminal Court. On May 11th of the same year, he had killed his wife in an attack of maniacal frenzy; he was tried and adjudged insane. The record shows him to have been afflicted with delirium tremens twelve years ago, and to have been struck twice on the head with a sling-shot. He was the father of eight children, of whom one girl was an imbecile and one boy an idiot.

When I saw him first he was in a state of mild maniacal exaltation of a deeply religious nature; for days at a time he would kneel in fervent prayer. By dint of kindly talk and expressions of warm sympathy, I succeeded in gaining the poor fellow's confidence. He proved very tractable and submissive, permitting himself to be coached into reading books, carefully selected with a view of diverting his mind from its accustomed sombre haunts.

About six months ago, he developed a typical melancholia, with its profound mental agony and unappeasable agitation. This was soon followed by absolute food-refusal, which necessitated the institution of forced feeding by means of the stomach-tube. He gradually acquired to perfection the faculty of regurgitating the entire quantity of the liquid food introduced, which compelled us to resort to feeding with very small doses of the most concentrated foods. In spite of our efforts, and rectal alimentation failing, our patient began to decline rapidly. On a few occasions I succeeded in convincing him that the heavenly powers did not approve his course, and then he would, for a short time, take nourishment without compulsion. A few weeks ago, he received a visit from the pastor of the church of which he used to be a faithful member. He gave the minister a solemn promise that he would take food if he were annointed. I gave readily my consent to this procedure that seemed rather unusual for a Presbyterian, and to my surprise, D. has kept his word thus far.

Here I shall relate the incident that has led to this report. On or about March 20th of this year, preparations were made in D.'s bedroom for the feeding process. The attendant placed the tube, a medium-sized soft-rubber instrument, on the window-sill, and, while awaiting the arrival of the physician, absented himself from the room, leaving D. seemingly helpless in bed. The latter appeared for quite a while incapable of performing the slightest act spontaneously; the complete cerebral inhibition caused him to micturate and defecate in his bed. After the lapse of a few

minutes the attendant returned, and in entering the room was passed by a patient suffering with lues cerebri, who was wont to wander about in a half-dazed fashion. His glance fell upon the tube, and to his amazement, he discovered that the tube had been severed in two, and that part of the tube had disappeared. Suspicious of the above-mentioned stuporous patient, the attendant subjected him to a thorough search but without avail. A careful search about the premises of D.'s bed and the abutting yard, proved equally fruitless. Another tube was procured, and the feeding process gone through with in the usual manner. The incident was much discussed at the time, but finally relegated to oblivion as an unravellable Chinese puzzle.

Nothing of any moment developed in D.'s case, except that the passage of an offensive watery discharge from his bowels had been noticed during the last few weeks. When I examined him, his abdomen was slightly tympanitic and somewhat tender. I attributed these symptoms to fermentative changes that so frequently accompany asthenias superinduced by whatever cause. On April 20th, we were called to the ward, where the night attendant inquired whether a bougie had been inserted into D.'s rectum, and left *in situ* for a special purpose. When the cover was removed we found about six inches of rubber tubing hanging from the patient's anus, and then pulled out a piece of tubing 22½ inches long. The recollection of the almost forgotten incident of the disappearance of part of the stomach-tube, flashed upon us; the examination of the two pieces proved them conclusively to be contiguous parts of the same tube, and thus our puzzle had found an unexpected solution.

There is no question in my mind that D. had taken advantage of the attendant's absence, gathered up his energy, swallowed the tube, a procedure of the greatest ease with him, and bitten off the remainder of the tube. The motive for this action must be sought either in the desire to frustrate our attempts at interference with imagined designs of the divine powers, or what is more likely, in a sudden impulse of ending his life in such an unusual manner. The most interesting feature in this case is the passage of the long piece of tubing past the pyloric valve, and its gradual propulsion along the alimentary tract, the entire process having extended over one month. This is another illustration of the possibilities of intestinal peristalsis.²

Medical Progress.

REPORT ON CHEMISTRY.

BY WILLIAM B. HILLS, M.D.

CREATININE.

ACKERMANN'S experiments,¹ made on a man on a mixed diet, and doing regular work, show that, in the mean, the daily output of creatinine is 1.254 grammes or 0.017 gramme per kilo. of body weight. The amount is lessened by rest.

² Here I presented to the Society both pieces of the tube; the one removed from the patient appears slightly discolored, and strongly permeated with fecal odor.

¹ Journal of the Chemical Society, London, February, 1896, ii, 121, from Compt. rend. Soc. Biol., 1894, 659.

¹ Read (by invitation) before the City Hospital Medical Association, May 7, 1896.