infusion remained without undergoing fermentative changes for a period of six weeks during warm weather. What was the cause of this stability? It was clearly not due to the air of the vault being dry, for the object preserved was a liquid. It would seem to be due to the comparative freedom of the atmosphere from floating particles. The stillness in the vault is remarkable. The dust which enters it soon settles down gently. But, then, five of the tubes contained turbid liquid. It is evident that germs from the air found their way into these tubes through their narrow necks. The air, then, was not quite free from floating germs. On lofty situations in Alpine regions Tyndall found the air so pure and free from dust that organic liquids exposed for months to the air remained unfermented. It may be that the air in the vaults of St. Michan's Church is very free from dust, and that it is owing to this cause that organic matter does not freely decompose in them. I am disposed to believe that, in the case of dead bodies, the dryness of the air is a factor in the preservation of the bodies. A coffin containing a body was removed from the soil of a graveyard, and deposited in one of these vaults. It was soon covered with large masses of moulds. After a while the damp coffin became dry, and in process of time the moulds, the natural habitats of which are damp situations, disappeared.

In conclusion, I venture to think that the results of my anti-septic experiments in a mortuary vault, long unpublished, are sufficiently interesting to warrant my bringing them under the notice of the Academy of Medicine. I trust that the recital of them may induce other persons to institute experiments in these very interesting vaults.

ART. XXII.—*Remarks on Some Cases of Bronchitis.*^a By GEORGE ST. GEORGE, M.K.Q.C.P.I., L.R.C.S. Edin.; Surgeon to the County Antrim Infirmary.

BRONCHITIS is a very prevalent complaint, and not only is it of frequent occurrence in different persons, but one of its chief characteristics—and perhaps its most formidable one—is its great tendency to recur again and again in the same person, and often at the same periods of time, the attacks increasing in severity and duration from year to year, until at length the sufferer is scarcely

^a Read before the Ulster Medical Society, January 8, 1884.

ever entirely free from their effects, and becomes gradually disabled from all active employments.

Moreover, in estimating the importance of a thorough study of this disease, we must not overlook the fact of its peculiarly wide and intimate relations with other diseases both of the lungs and of other organs, and with several of the commonest forms of dyscrasia to which the human frame is liable.

Bronchitis, as we are all well aware, is essentially an inflammatory affection of the bronchial mucous membrane, attended with more or less of flux from the inflamed surfaces. As regards its usual symptoms and physical signs, I shall not now enter into any separate detailed exposition: we are all familiar with them; and it will be more convenient to incorporate any explanations which I may deem it desirable to make on these points with other practical comments on the cases which I shall quote in illustration of my subject. But though bronchitis is always manifested by somewhat similar symptoms, and is therefore pathologically known by one name, it is by no means of uniform character in different persons, but varies much in extent, intensity, and duration. Thus it may be limited to the larger bronchial tree, or it may extend to the capillary tubes. It may be a more or less severe, acute attack, running a comparatively rapid course, and ending in perfect recovery; or it may assume a sub-acute or a chronic form, and its duration be indefinitely protracted. In its severer forms it is a very fatal disease, especially to the young, the delicate, and the aged. In its milder forms it is attended by no immediate danger to life; but as a bronchial membrane which has once been inflamed is very prone to a recurrence of inflammation from comparatively slight causes, even a mild attack of bronchitis may, especially in persons whose health is otherwise not perfect, become the starting-point of a chronic bronchial affection, and thus lay the foundation for a life-long delicacy, or for various secondary ailments.

In the next place, although the general symptoms of bronchitis are always very similar, inasmuch as it is always the same structure which is the seat of irritation, this irritation may be produced by various causes—some proceeding from without, and others from within the organism—some accidental, and others constitutional. One cause, above all others, produces, especially in this locality, an immense amount of bronchial disease—I refer to the fine dust and fluff inhaled by the operatives in the large flax spinning mills of this and neighbouring towns. Vicissitudes of weather and

exposure to cold or damp are, however, generally regarded as the only exciting causes of bronchitis. Sometimes such exposure is, in fact, the only cause, as when an attack of bronchitis results from remaining for some time wet-shod, getting chilled, or wet through on a journey, or else from passing, without proper precautions, from the hot, dry air of a house to the cold or damp atmosphere out of doors. And again, it is notorious that vicissitudes of weather, such as the setting in of a cold, biting east wind after great heat, often serve as an exciting cause of bronchitis. Nevertheless there can be no doubt that in the majority of cases such causes only excite the disease when a strong predisposition to it already exists, either from some constitutional derangement of health, or else from delicacy of the bronchial membrane consequent on previous attacks of bronchitis or on long-standing local irritation arising from the inhalation of dust, &c. I am, besides, well assured from careful observation that bronchitis is sometimes the direct consequence of some constitutional vice apart from exposure to any external exciting cause. In confirmation of this opinion I may remind you that bronchitis, although certainly far more prevalent in the colder season of the year, is by no means peculiar to it, and in some cases even has a definite tendency to recur periodically in summer instead of winter, and usually on such periodical recurrence to be associated with some well-marked constitutional disorder. I have already alluded to the intimate relations between bronchitis and various other ailments, local and constitutional. These relations may be either of cause or consequence, as when, on the one hand, bronchitis produces some secondary lesion either of the lungs or heart, or some more remote sequence, such as disease of the liver or kidneys; or when, on the other hand, bronchitis is itself the secondary result of some constitutional vice, such as gout, syphilis, or some local affection, such as cardiac or renal disease. Bronchitis may thus be either a primary or a secondary affection—primary, as when it is the result of exposure, or when the irritation, excited by the inhalation of dust, &c., develops the disease; secondary, as when the bronchial affection arises out of some previously existing ailment, such as any of those I have just mentioned. Again, bronchitis may be associated as a complication with other diseases, as measles or whooping-cough, or with other pulmonary affections, such as pneumonia or phthisis.

The subject indeed is such a wide one that I do not purpose, neither would it be possible for me, to enter into its consideration

exhaustively in the compass of a paper like this ; but I make these few observations with the hope of drawing attention to the great practical importance of studying a disease, the variety of causes, complications, and consequences of which must obviously render the diagnosis, prognosis, and treatment equally various in different cases.

In order to bring the several relations of bronchitis to which I have alluded more plainly before you, I will, with your permission, read notes of a few cases illustrative of them, which have come under my notice in the County Antrim Infirmary, and in my private practice :—

CASE I.—D. L., aged thirty-six, mechanic, was admitted under my care into the Co. Antrim Infirmary, on June 16th, 1880. About six years previously, after a very warm day's work, and while still perspiring freely, he bathed in the River Lagan. He was attacked at that time with a severe cold, and since then has been subject to a cough, from which indeed he is now seldom free. This chronic cough is at any time easily aggravated by exposure ; and he has been laid up more or less with it every winter. There is no family history of phthisis, and he has never suffered from gout or rheumatism, nor indeed from any other ailment, except bronchitis. On admission he complained of dyspnœa, and had a frequent hard cough, attended by the expectoration of a thin, transparent, frothy mucus, mixed with opaque yellow masses ; skin cool ; pulse 72. The chest was well formed, and rose equally and evenly on both sides during inspiration, but the breathing was laborious, the sterno-mastoid and scaleni muscles acting powerfully as elevators during inspiration, and the supra-clavicular regions being depressed at the same time. But although the breathing was thus difficult, it was not accelerated in proportion, there being only twenty-four respirations per minute. These symptoms are all characteristic of bronchitis. Both in pneumonia and progressive phthisis the skin is usually pungently hot ; whereas, even in the febrile stage of acute bronchitis, when uncomplicated with either pneumonia or tubercle, although the temperature may be raised, the skin seldom conveys to the hand any remarkable sensation of heat ; and in cases such as this one, frequently does not exceed the normal warmth. The pulse also in bronchitis never rises as high as in phthisis or pneumonia ; and very often, in cases of a chronic character, does not exceed the normal frequency.

Again, though the respiration is generally much quicker in the other pulmonary diseases than it is in bronchitis, yet it is never so laborious. Even, with greatly accelerated respiration, patients suffering from pneumonia are often not conscious of dyspnœa ; whereas, in severe

bronchitis, laborious breathing is the rule. With respect to the nature of the expectoration, the thin, transparent, frothy expectoration is indicative of recent bronchitis, or rather of a recent attack engrafted on an *old* chronic affection, as is shown by the frothy expectoration being mixed with the opaque yellow mucus characteristic of chronic bronchitis. In order to complete the history of this case there are two other points to which I must allude. The front of the chest was resonant on percussion from apex to base on both sides; distinct pulmonary resonance being elicited by percussion, even over the cardiac region. The percussion note was also clear posteriorly. The respiration was feebly heard over the left mammary region; in other places it was sometimes harsh, and it was everywhere more or less sibilant. The heart was seen beating immediately below the xiphoid cartilage. The heart sounds were feeble, but free from murmurs. This displacement of the heart was evidently due to emphysema, the presence of which was indicated by the abnormal clearness over the whole front of the chest, with slight enlargement of the right side of the heart. As regards the treatment and progress of this patient, I may say that he improved under a mild antiphlogistic and tonic treatment, consisting of at first the following mixture three times a day:—

R. Tr. scillæ, m. xv.
 Sp. æther. nitr., ʒj.
 Liq. amm. acet., ʒij.
 Tr. hyoscyam., ʒss.
 Aq. camph., ad ʒj. M.

As soon as the urgent symptoms had subsided, I substituted the following:—

R. Acid. nitro-hydrochl. dil., m. x.
 Tr. hyoscyam.
 Tr. laricis, āā. ʒss.
 Inf. gent. c., ad ʒj. M.

To be taken three times a day.

Under this treatment he improved, and was discharged, relieved, in about six weeks.

This case belongs to a class in which great benefit may be derived from medical treatment during exacerbations of the bronchial affection, and in which much may be done by care and proper management to retard the progress of the disease; but in which the disease itself has too firm a hold to give us much hope of being able to effect a permanent cure, especially in persons liable to exposure. I have little doubt that on the first such occasion my patient will suffer a fresh return of his malady, and find his way for relief to me, or some other medical man.

I will now draw your attention to a case drawn from a class very common in this part of Ireland; I allude to bronchitis caused by the inhalation of dust mixed with fine particles of flax.

CASE II.—R. M., aged forty, hackler, was admitted under my care into the Co. Antrim Infirmary on April 20th, 1883. His work consists in drawing the flax after it has been scutched through a series of iron pins, so as to remove the rougher parts. As the workman stands before these pins, and swings the flax up and down in front of his face, it is evident that a large quantity of the fine particles must be constantly inhaled.

Attempts have been made to induce the flax-dressers to wear respirators whilst at their work, but to no purpose.

He had long suffered from cough and tightness of breathing, and latterly also from difficulty of breathing.

At the time of his admission his skin was cool, and pulse quiet, the expectoration scanty, opaque, and of a yellow colour. The chest was resonant on percussion, both in the anterior and scapular regions; but there was a slight degree of dulness over the bases of both lungs posteriorly. The respiration was feeble in the apex of the right lung, and harsh in the apex of the left. The respiration was tubular near the right nipple, and coarse crepitation was heard over a limited space near the left. There was fine crepitation in the base of the right lung, and a large mucous rle in the corresponding part of the left; urine normal. He was ordered a mixture, containing in each dose, three times a day—

R. Ammon. carb., gr. 5.
Tr. scill.
Tr. camph. c. , . xv.
Inf. seneg, ad j. M.

In about a fortnight, as he had improved, I gave him two drachms of cod-liver oil after each meal, and as a tonic before food a mixture containing—

R. Acid. nitro-hydrochl. dil.
Tr. camph. c. , . x.
Vin. ipecac., . vi.
Inf. gent. co., ad j. M.

I carefully examined him on the 22nd May, when I found the cough and dyspna greatly decreased. The moist sounds in the base of the left lung had given place to harsh dry respiration. The crepitation near the left nipple had disappeared, and the fine crepitation in the base of the right lung had become coarser, and less extensive. He continued to improve until the end of June, when he considered himself convalescent, and resumed his work.

I had under my care about two years before this a patient who remained longer under my care, and the history of whose case is more conclusive as to the cause of his complaint and the remedy for it.

CASE III.—J. W., aged twenty-two, a flax-dresser in a mill in Lisburn, consulted me on the 12th June, 1879. His work was much the same as that of the preceding case.

He had only followed this employment for eighteen months, and had previously been quite healthy, but had frequently during the year previous suffered from bronchial irritation. For several months before he had consulted me he had been troubled with much difficulty of breathing, and dry cough, attended by an opaque muco-purulent expectoration, which of late had been frequently streaked with blood.

On examination, he had a follicular sore throat, and a husky voice. His chest was well formed and normally resonant on percussion over its whole anterior aspect; posteriorly the resonance was also normal. The respiration was dry and sibilant in front; sonorous rhonchus was audible behind. Over the lower lobes of both lungs, and on the left side as high as the scapula, no moist sounds were anywhere heard. He was put on nearly the same medical treatment as the last patient, and was advised to change his occupation, which, in the meantime, he promised to discontinue. On June 26th the cough and expectoration had decreased. Rhonchus was still audible between the scapulæ, and in the lower lobes of both lungs. The respiration over the front of the chest was still dry and sibilant; expiration prolonged. By July 9th the rhonchus in the back had much diminished; he then went to Newcastle for change of air, and, on his return, reported himself quite well, and resumed his work, which he persevered in for several weeks. On Sept. 11th he returned with much cough, shortness of breath, and wheezing, especially at night.

The expectoration was more copious than before, thin, and frothy. He said his present attack had come on gradually, the first symptoms having been pain, and oppression over the sternum, which had appeared almost as soon he recommenced work. There was no hæmoptysis. His chest was still normally resonant on percussion; but the respiration was harsh and sibilant as before.

I warned him again, that if he wished to enjoy good health, he must give up his present employment. On Sept. 25th he reported to me that he was greatly relieved, and on October 16th he informed me that he had obtained work in another part of the factory, where he was free from dust, and there was already a manifest improvement in his symptoms—the cough and expectoration having much abated. I have had many opportunities of seeing him since, and he has continued in fair health.

We cannot fail to remark the very different degrees of rapidity with which this disease advances, and we perceive that this difference is due in part to more or less frequent occurrence of catarrhal accidents. Other circumstances peculiar to the patient—such as age, habits of life, and constitutional tendencies—are not without great effect on the progress and course of the disease, and of these the last-named especially exercise a most important influence in promoting and modifying its development. We can easily understand that the existence of any constitutional conditions must lessen the power of resistance, in the bronchial membrane, to the mechanical irritation exerted upon it, and thereby not only hasten the development of the disease, but add to its severity. On the other hand, if there be any tendency to tubercular disease, I can conceive nothing more likely to light it up in the lungs than such bronchitic irritation; and I have, in fact, in a few instances, seen the constitutional tendency and the mechanical existing cause in operation together, and have only been enabled by the history of the case to determine the coexistence of the two factors. The cases I have referred to are drawn from the poorer classes, but I am persuaded that the causes of the bronchial affection in all these patients are, within certain limits, in much commoner operation than might at first sight be supposed. Few private patients are exposed to these noxious influences in sufficient intensity to excite bronchitis directly, but very many unsuspectingly inhale dust or impure air to a degree which gradually produces slight bronchitic irritation, and renders them exceedingly liable to contract bronchitis on being exposed to any exciting cause.

Even the habitual travelling along a dusty road is apt to have this effect, and the constant breathing of hot and dry air in dwelling-rooms, especially if combined, as is too common, with imperfect ventilation, is a fruitful source of the same tendency. The employment of gas in apartments, unless proper appliances be in use for carrying off the products of combustion and for admitting fresh supplies of pure air, produce a dangerous state of the atmosphere. These are things of no small consequence to be borne in mind in private practice.

It is still common for bronchitic patients to shut themselves up in close, hot rooms, and breathe impure air, with the idea that by so doing they are thereby avoiding draughts, although, in fact, they are aggravating their ailments by so doing, and retarding their cure.

No doubt there are cases in which we find it necessary to keep our patients for a time in an artificial temperature, but we should take care that while the air of the apartment is warm it should never be allowed to become dry. Even the simple device of keeping a kettle of boiling water on the fire, with a tube long enough to throw a constant jet of steam into the room, will suffice to moisten the air, and with proper contrivances ventilation may be always obtained without danger to the most susceptible patient. By far the greater number of bronchitic patients, however, actually do better when not kept in rooms at too high a temperature, inasmuch as they sustain less injury to their general health, and are able to go about earlier, and with less risk of taking cold from any slight exposure, than those who have been so confined. It is not so much a warm as a moist atmosphere that is needed by bronchitic patients, with ample protection from chilling of the surface, and this may be secured by suitable clothing. In fact, as a rule, I have found that, all things being equal, bronchitis is slower in its progress, and less speedily affects the general health, in persons whose duties take them much out of doors, than in those who, from their in-door employments, would generally be presumed to be less exposed to causes of taking cold, and less liable to attacks of their complaint.

I will now make a few remarks on the treatment of the class of patients I have brought under notice. When patients come under my care with an acute attack of bronchitis, I find it best to act on the skin, to promote expectoration, and relieve the inflamed mucous membrane. For this purpose, if the pulse be of good volume, and the patient's strength not impaired, I give a mild diaphoretic mixture of Mindererus' spirit, antimonial wine, and tincture of henbane, and occasionally a little ipecacuanha wine. If, however, the patient be depressed, I give the *vinum ipecacuanhæ* without the antimony. Later on, or in less acute cases, I find the more stimulating expectorants, as squill, the most effectual; but in almost all cases, especially in chronic bronchitis, a time arrives when expectorants cease to be useful. The expectoration indeed continues, but it rather is of the nature of a habitual flux than the result of active irritation.

The treatment now requires to be of a tonic character, and though zinc, iron, or quinine, are all useful, I have found the mineral acids, especially the dilute nitro-hydrochloric acid, in combination with a vegetable bitter, as quassia or gentian, the most

advantageous. In chronic cases attended by very copious expectoration, balsamic remedies, as gum ammoniacum, &c., are often of service, but I have found them, as a rule, apt to disagree with the stomach, and as the digestive powers are in such cases often feeble, I have been accustomed to give tincture of larch in mixture, or tar in two-grain pills, which never disagrees, and is equally, if not more serviceable to the bronchial affection.

Its effect is not only to lessen the expectoration, but also apparently to restore the debilitated membrane to a more healthy tone, and to render patients less liable to attacks of catarrh.

Useful as medicines undoubtedly are in allaying or curing attacks of bronchitis, I need hardly tell you that whenever the bronchial affection is even partially referable to an existing external cause, no permanent good can be effected without the removal of that cause.

Amongst the working classes it is often impossible to accomplish a change of employment, though I have seen cases, such as the one I have related, in which a change of occupation has been effected, and the patients have recovered; but amongst the higher classes much may be accomplished—I say whenever the bronchial affection is even partially referable to an external cause, because, as I have said before, cases of primary bronchitis are comparatively rare. Even amongst hospital patients external causes in a large majority of cases only develop or aggravate constitutional or hereditary tendencies to bronchial disease, and this naturally obtains more among the upper classes, who are exposed to such causes only in slighter degrees.

Time will not permit me to do more than refer to a few cases of gouty bronchitis. I have mentioned before that in a large number of cases bronchitis is a secondary, and not a primary disease—that is to say, a disease arising out of some other previously existing ailment or constitutional dyscrasia.

As in the beginning of this paper I have touched upon examples of primary bronchitis arising solely from exposure to external exciting causes, I now therefore purpose to consider gouty bronchitis. All these cases which I will now refer to have suffered either from gout or chronic rheumatic gout. I am indeed aware that some of our highest authorities consider regular gout and rheumatic gout as entirely different complaints, and no doubt there is a pathological distinction between them, but clinically regarded they are allied ailments affecting the same tissues, and

often seeming to occur in members of the same family as manifestations of a common hereditary diathesis.

CASE IV.—E. M'K., a carpenter, aged fifty, became a patient in the County Antrim Infirmary, on Dec. 1st, 1882. His father had been a butler, and suffered from gout, and died from asthma, aged sixty-six. One of his brothers suffers from rheumatism, and another from chronic bronchitis.

The patient himself had had several attacks of rheumatism and sciatica. He had also for years been subject to a severe cough in winter, which usually began in October, and lasted till March. The cough was attended with much dyspnœa, and by frequent paroxysms of the same at night.

These generally came on at one or two o'clock in the morning, after he had been asleep, compelling him to sit up in bed for a longer or shorter time. The paroxysms of dyspnœa are not, as a rule, common in bronchitis.

Dr. Graves, in his "Clinical Lectures," says that he scarcely ever met with a patient who had been subject to chronic bronchitis who did not also labour under more or less asthmatic dyspnœa, but it is more than probable that Dr. Graves used the term for the dyspnœa, which is commonly attendant on chronic bronchitis, especially when complicated either with pulmonary emphysema or with cardiac disease, and which is only paroxysmal, inasmuch as it is aggravated by every physical exertion, and by every accession of catarrh.

So far as I could learn, it was in this latter sense that my patient applied the term asthmatic to both his parents. At the same time, asthma, like bronchitis, is often connected with a gouty diathesis, and I have no doubt that in this patient this diathesis was the cause of both complaints. At the time of his admission the patient's skin was cool. Pulse, 85; respiration, 36. His cough was troublesome, and his expectoration thin, white, and frothy, but, he said, more generally thick, and of a yellow colour, and had sometimes been streaked with blood.

On examination his chest was found to be broad and deep. The veins of his thorax were turgid, and most markedly on the left side, and respiration was laboured.

He said he was never free from dyspnœa, even in summer, especially in hot weather. The percussion note was clear over the whole front of the chest, especially in the mammary regions, and the clear sound encroached somewhat on the normal cardiac dulness. Posteriorly there was resonance on percussion, excepting over the base of the left lung, where it was slightly deficient. The respiration was harsh, expiration prolonged. Rhonchus was more or less audible over both lungs, and moist sounds were heard with inspiration in the base of the left lung.

The heart's apex was somewhat depressed. His urine was not albuminous. The patient continued under treatment until February, when he was discharged almost well as regards the bronchitis, and without having any return of the symptoms of rheumatism or sciatica.

It is indeed true that the gouty form of dyscrasia is exceedingly common not only amongst private patients, but also the working classes. But, common as it is, gout is found in a very much smaller proportion of the total number of our hospital patients than of the bronchitic class of patients taken by themselves; hence I think I am justified in the conclusion that there is really an intimate relation between a gouty constitution and chronic bronchitis, and that in many cases in which a hereditary tendency to gout has not been developed into the characteristic form of that disease it manifests itself in the form of chronic bronchitis. In further support of these views I may mention that I have frequently known bronchitis and gout or rheumatism habitually to alternate, an obstinate attack of bronchitis sometimes subsiding on the occurrence of a fit of gout, and again at other times a smart fit of gout being relieved by the development of bronchitis.

There was an elderly man for a long time under my care. His ailments were rheumatic gout, eczema, and bronchitis, and he was rarely, if ever, free from some one of them. No two of the three were ever present together; but just as he was congratulating himself on having got rid of the rheumatism, his legs would be attacked with eczema, and this would disappear in a few weeks, to be succeeded by an attack of bronchitis.

I will now mention one or two cases *à propos* of this form of bronchitis:—

CASE V.—H. M'C., a wheelwright, came under my care in 1876. He had then been ailing a year and a half, during which time he had suffered alternately from cough and what he called rheumatic pains in his knees and elbows. At the time of his consulting me he had slight cough and dyspnoea, but he principally complained of gastralgia of some weeks' standing.

The pain came on soon after eating, and was excessively severe. This gastralgia, I may observe, was doubtless but a different manifestation of the same disorder of health which induced the bronchitis and the so-called rheumatic pains. This form of dyspepsia is very common in persons of gouty diathesis, who have never had paroxysms of acute gout, and, like other forms of the disease, may either give place to some new train of gouty symptoms, or be relieved by a fit of gout itself. On this

occasion the patient was soon relieved from his ailments by the use of bismuth, &c., in combination with a bitter infusion, and of small doses of blue pill and rhubarb, but he returned to me on May 27th of the same year, with pain and tenderness in the soles of his feet, and with lepra on the arms and knees. He said he had of late suffered but rarely from gastralgia, and only then in very slight degree; neither had he any cough, but he was not free from dyspnœa. I gave him 10 grains of iodide of potassium, with 5 minims of colchicum wine three times a day, to which, as the pains abated, I added small doses of arsenic. On July 22nd the pains had for some time entirely left him, and the eruption was gradually disappearing, but he had again begun to cough and expectorate, and he complained of increased shortness of breath. The chest was normally resonant, but harsh rhonchus was audible throughout both lungs. He was ordered small doses of liq. arsenici hydrochlorici and acid. hydrochlorici dil. with cod-liver oil, and some extract of hemlock at night to allay the cough.

He was soon relieved, and ceased to visit me. Late in October he again consulted me for lumbago and pains in the knees and elbows, having then no cough, but the lepra, which had never altogether left him, was much increased. As these ailments yielded (after about five weeks' treatment), he once more began to cough, and suffered from bronchitis throughout the winter. On the 20th April, 1877, he was quite free from pain and the lepra, and had only a little cough and expectoration on first rising in the morning. I now put him on a course of dilute nitro-hydrochloric acid and tincture of larch, and he was quite well in June.

I have already said that when bronchitis occurs in persons of gouty diathesis, it frequently happens, on the one hand, that bronchitis makes its appearance on the subsidence of the gouty symptoms; and again, on the other hand, that a fit of gout relieves the bronchitis. The following case illustrates the latter mode of alternation:—

CASE VI.—W. J. B., aged sixty, brewer, was admitted into the County Antrim Infirmary, October 22nd, 1880. He stated that he had for many years been subject to cough and expectoration, with great dyspnœa, in summer as well as in winter, as much in hot as in cold weather. A medium temperature suited him best, extremes always increasing his distress. He had had regular gout for the first time twenty years previously, and said he was in the habit of suffering from gouty pains in the hands and feet, but he was free from them when admitted. He was also subject to occasional psoriasis. On inquiry he admitted that he drank a great deal of beer and porter, as he was brought in contact with it in his business.

The patient himself referred his complaint to exposure to cold during his work, but the sudden appearance of the gout having preceded that of the bronchitis, and it having been accompanied or followed by gout in three attacks out of four, we may reasonably assume that these exposures were, at most, only the immediate exciting causes of irritation in a bronchial membrane already predisposed to disease by existing constitutional derangement. When admitted, he was suffering from a pretty severe attack of bronchitis, attended by much dyspnœa and by a copious frothy expectoration; but he said that though he was never altogether free from expectoration any more than free from cough, it consisted, during the intervals between the more acute attacks, of only a small quantity of thick, transparent, bluish mucus. Now, this is the exact counterpart of what we meet with every day in bronchitis, more particularly in those who have also a gouty constitution. They habitually cough up in the morning, and, it may be, at rare intervals through the day, little pellets of tenacious, bluish, starch-like mucus, sometimes studded with darker specks. This ailment, which may be perhaps almost too slight to attract the patient's notice, is quite compatible with good health in all other respects, but it is nevertheless the proof of an abnormal condition of the bronchial membrane. In the healthy state only just as much fluid is secreted as is necessary to keep the bronchial membrane moist enough for the due performance of respiration. We may therefore safely assume, as a rule, that wherever there is expectoration, however small in quantity, the membrane is not in a state of perfect health, and therefore is far more liable than a membrane in the normal condition to suffer from any intermediate exciting causes of bronchitis of whatever kind. But to return to my patient. I treated him successively with carbonate and infusion of senega, then with dilute nitro-hydrochloric acid, tincture of gentian, ipecacuanha wine, and tincture of henbane.

On December 11th he was in all respects greatly improved, and passed from under my care on January 16th of the next year.

He came to me again on May 6th of the same year, suffering from gout of the fingers of his left hand, and also from cough, attended by the white, frothy, and mucous expectoration characteristic of recent bronchitis. There was also slight œdema of the ankles, but the urine was free from albumen.

The chest was found on examination to be normally resonant on percussion. Sibilus and rhonchus were more or less audible throughout both lungs. The expiration sound was prolonged, especially in the upper lobes, and mucous crepitation was heard in the base of the right lung. Taking into consideration the mixed character of the illness, showing the actual coexistence of gout and bronchitis, I prescribed a combination of medicines calculated to meet both aspects of the case—that is to say, I gave 4 grains each of potassium iodide and carbonate of

ammonia, 10 minims of colchicum wine, and 20 minims each of tinctures of squill and henbane in an ounce of camphor water, three times a day, and $2\frac{1}{2}$ grains each of extract of hemlock and pill of ipecacuanha and squill every night. This is a plan of treatment which, modified according to circumstances, I have found often very serviceable in similar cases, and under it the patient gradually improved; but at the end of a fortnight, his appearance being anæmic, a grain of sulphate of iron was substituted for the ammonia in each dose of his mixture. The gout soon disappeared, but the mucous crepitation in the base of the lung still continuing without change, I ordered him a mixture containing 20 minims each of liquor ferri perchloridi and tincture of henbane, and 10 minims each of vinum ipecacuanhæ and acidum hydrochloricum dilutum in an ounce of infusion of quassia. He now rapidly recovered, and continued well, and was discharged in August.

He next returned on 5th May following, when he was admitted in an almost similar condition. The finger joints were swollen and painful, and he was suffering from cough and dyspnœa. The bronchitis was, however, in a more advanced state, the expectoration being now thick, opaque, and muco-purulent, instead of glairy and frothy, as on his previous admissions. He was treated in a similar manner, but improved more slowly than the year before. The cough varied from time to time; but though better on the whole, was by no means gone when, towards the end of June, he was attacked by gout in a more pronounced and regular form, affecting successively the balls of both great toes, the ankles, and fingers. On the appearance of gout in this acute form the cough and expectoration at once abated, and I ordered him as a mixture, three times a day, the following:—

R. Ferri sulph., granum.
 Potass. iodid., gr. 5.
 Vin. colchic., m. xv.
 Glycerin., ʒj.
 Aq. menth. pip., ad ʒj. M.

and a pill at bed-time, consisting of two grains of acetous extract of colchicum and three grains of Dover's powder.

This treatment he continued, with some modifications, for a month, when he was discharged cured. But his relief was only temporary, as he returned on December 5th. His cough had returned, with much wheezing and dyspnœa, and with the frothy transparent expectoration I have described as characteristic of bronchitis. His skin was cool; pulse 90, but quite regular. The sides of his chest rose evenly in respiration, and were equally and normally resonant on percussion. The heart sounds were normal; rhonchus and sibilus were audible over the lower lobes of both lungs posteriorly, intermixed with faint mucous crepitation in the base of the left lung; urine was normal. At this time he was

quite free from gouty pains, so I ordered him the squill mixture I gave the first patient, with twenty minims of tincture of henbane every six hours. But bearing in mind his gouty tendencies I added a pill at night of colchicum and Dover's powder as before. He soon improved greatly as regards the cough, and the expectoration diminished, and became opaque, and of a bluish colour, but the subsidence of the bronchial affection was again simultaneous with the development of gout, though of a less acute character than on the last occasion, this difference being possibly due to the specific treatment the patient had been undergoing before its appearance. In addition to the night pill he again took the iodide of potassium, carbonate of ammonia, and colchicum wine, and soon ceased to be treated, being quite free from both gout and bronchitis.

Time will not allow me, even if I wished, to bring forward cases showing the true relation which I believe to exist between bronchitis, on the one hand, and gout, eczema, or psoriasis or gravel on the other. All these different maladies evidently depend upon a common humoral dyscrasia, which in one case produces gout, in another gravel, in a third psoriasis, or, as in this last case, bronchitis, coexisting or alternating with one or more of these other ailments. These cases are all therefore examples of what I have called secondary bronchitis—that is to say, bronchitis arising out of some internal condition of the system, that internal condition being, as we have seen, the existence of the humoral dyscrasia, which is known as the cause of gout.

Regarding the treatment of this form of secondary bronchitis, it is clear from the necessarily complicated nature of the subject that I cannot pretend to give any specific directions. The remedies appropriate to the bronchitis and to the other affections must obviously be varied and modified from time to time, in order to meet the constantly varying condition of different patients, and of the same patient at different times. The one essential point towards the successful treatment of all such cases is that we should constantly bear in mind the presence of a constitutional cause for the local affection, and not rest satisfied with directing our efforts towards the removal or alleviation of the bronchitis, but endeavour, as far as possible, to combat the dyscrasia, which is the real source of our patient's ailment.