entertained as to the structure of cells and nuclei had, in late years, undergone much change.

Modern observation had shown the nucleus of cells to consist of two distinct substances; one, called 'chromatin,' from being coloured by reagents; the other, achromatin, not being capable of coloration. Achromatin was generally amorphous; chromatin always had a definite form, being generally arranged as a membrane on the outside of the nucleus, and being prolonged in the interior in the form of a network, on which lay masses of chromatin constituting the nucleoli. In some cells, the chromatin was chiefly arranged in filaments, and nucleoli were absent; sometimes it was arranged in a striated form, or in rows of particles. Division of the nucleus was usually attended with changes in the chromatin, which became arranged in the form of a rosette around the centre of the nucleus, and broke up into filaments. The achromatin also underwent change.

As regarded the structure of the cell-protoplasm, there was less agreement of opinion than concerning the nucleus. The protoplasm was formerly supposed to be a structureless homogeneous material, and the definition of Dujardin's "sarcode" would very closely agree with the old description of the cell-protoplasm; but it was now admitted by everyone that the protoplasm often had a reticular appearance. The analogy of this with the reticular structure of the nucleus, had led some to teach that the nucleus and the cell were identical, one part being merely more condensed and marked off from the rest. Heitzmann had represented the reticular structure in cartilage-cells as passing, not only through the nucleus and protoplasm, but through the intercellular substance, so as to become connected with other cells. But there was an objection to the acceptance of this view, inasmuch as the reticulated appearance might be produced artificially by alcohol and other agents used in preparation; and, further, it could not always be seen in the living subject. A living cartilage-cell showed filaments in the protoplasm, but these were not connected in the form of a network. Nor had there been seen any sign of reticular structure in the amoeba, or in such bodies as the colourless blood-corpuscles of the neut or salamander. In organisms of this kind, the protoplasm often presented a reticular appearance, due to the taking in of globules of fluid. Sometimes granules were taken in by means of pseudopodia, and gave the protoplasm the appearance of a network; but this was very different from what was described by Heitzmann, Stricker, and others. The lecturer referred to a book by Heitzmann, in which the idea of reticulation was applied to all structures of the body.

The term "cell-contents" next demanded notice. It originally meant all that was included within the cell-membrane which was supposed to exist; afterwards it was applied to the fatty, albuminous, starchy, and other matters incorporated in the protoplasm, but distinct from it. The term was now rarely used, but it was still necessary until a better one could be suggested. "Paraplasm" had been proposed, but it was also used in another sense. It was therefore better to use the old term "cell-contents" to describe any substance included within the protoplasm. A reticular appearance of the protoplasm might be produced by the cell-contents; for example, the fatty granules in the cells of the sebaceous gland of the cat, and the cell-sap in vegetables.

So far, the lecturer said, the cells described had little of specialisation in function; but secreting cells were highly specialised, and often the protoplasm presented differences, consisting usually in the development of fibrils. Such fibrils were most conspicuous in the cells of the kidney; they were also seen in the cells of the ducts of the salivary glands, and in those of the pancreas. These fibrils took generally the direction of the flow of the secretion. In some instances, as the columnar cells of the intestine, a striation of the fibrils was observed. In other instances, as the liver, where the direction of the flow of the secretion was uncertain, the arrangement of the fibrils was less definite; in the frog's liver, however, there was a tendency to converge in the direction of the ducts, but not so distinctly as in the kidney and salivary gland.

Modifications were also produced by the accumulation of the material to be secreted, such as carbohydrates, fatty matters, zymogen, etc. These might cause the protoplasm, as in the cells of the pancreas when containing zymogen, to have a reticular appearance; but when the zymogen was discharged, no trace of reticulation was left, the protoplasm presenting a homogeneous appearance.

In secreting cells, the cell-contents fell under two categories; first, there were the secreted materials, such as albuminous matters, glycogen, and fat; the last was best shewn by means of osmic acid. In the liver-cells, there were both fatty matters and hydrocarbons. These were supposed to be intended for the nutrition of the cell, but no positive assertion with regard to this could be made, for they

might be the result of cell-activity, and of the breaking up of the contents. Other cell-contents were discharged, such as the pigment of liver-cells, crystals of uric acid, etc. These might undergo further change after being discharged, so that it was unsafe to draw a conclusion as to the chemical nature of cell-contents from the characters of the secretion.

The lecturer then alluded to the manner in which the secreting cells were arranged. This varied much, from the simple flat membrane to the different forms of glands. A more important matter was the relation of the secreting cells to the rest of the organ. The secreting epithelium nearly always rested on a basement-membrane, which, in some parts, appeared perforated, but, when more closely examined, was found to be not so, the membrane being merely thinner. The blood-vessels were very rarely in direct relation with the cells; they seldom penetrated the basement-membrane, and were separated from the secreting cells by the lymphatics. Hence the material for the nutrition of the cells must be derived, not from the blood, but from the lymph of the gland.

That nerves bore a relation to the secreting cells was certain, but the manner of their terminations could not be said to have been successfully made out. It was thought, about fifteen years ago, that the passage of the axis-cylinder into gland-cells had been discovered, but this had not been confirmed.

HEALTH-RESORTS IN ULSTER.

By ROBERT ESLER, M.D., Belfast.

THE attention of the members of the British Medical Association was directed to the north of Ireland during the meeting of the Association in Belfast last year; and the recent visit of the Prince of Wales has drawn the attention of a larger circle of the reading community to the emerald Isle. Thousands from all parts of Britain annually visit the north, on account of its bold and varied scenery; but little is known of the comparative merits of the various localities as health-resorts.

As the Association has now a large membership in Ulster, some particulars of a few of the most fashionable summer resorts may be of interest; but, before entering upon the details of the various localities, some attention might be given to the general laws which are essential to enable any town or district to be designated a health-resort.

That people of all classes leave their comfortable homes, and at some cost, and often great inconvenience, remove to seaside, stuffy, damp, incommodious cottages, badly drained and badly ventilated, to seek for health, or to renew the amount of vigour they may possess, is matter of yearly observation; and that they do so especially for the good of the children of the family is commonly alleged.

How much of this habit may be laid at the door of the medical adviser, I am not in a position to say; but am aware that a large proportion of the fashion in this direction is attributed to medical men. It may be in the matter of sea-air as it is with alcohol; people like it, and they get some one willing to prescribe it. To the hard-working business man, the rest of a seaside holiday, with change of scene, may be the best way to enjoy mental recoil and regain physical tone, but that it is universally required by women and children is a more doubtful point; much, of course, will depend on their home, their surroundings, and their condition in life.

Where variety can be had without discomfort and inconvenience, and where the matter of expense does not bulk largely as a factor, there can be no reasonable objection to a sojourn at one of the many health-resorts which this and other countries offer.

The habit of taking an annual holiday has become so common to dwellers in large towns that the fact may as well be recognised. It will be the object of this paper to point out some of the health-resorts which are to be found in Ulster, and to give as many statistics as are available in relation to their sanitary condition.

The purity of the air we breathe, and of the water we drink, is so important to the well being, and even to the continuance, of human life, that attention to these matters, in the different localities of any country, should be abundantly bestowed by medical men who have the guidance of their patients in connection with their residence, their sojourn, and their holiday-resorts in any given locality.

The province of Ulster is composed of the counties Antrim, Armagh, Cavan, Donegal, Down, Fermanagh, Londonderry, Monaghan, and Tyrone. The climate varies considerably from north to south, but the general character of the whole province is cold and damp, although during the summer months the clear bracing air of the northern coast is exceedingly pleasant. The principal health-

resorts are situated in counties Antrim and Down, although many select the highlands of Donegal as their sanatorium.

ROSTREVOR.—The beautiful watering-place of Rostrevor is situated on Carlingford Bay, at the southern extremity of County Down. The village is small, and does not consist of more than about three hundred houses. It is sheltered from the north and east by the Mourne mountains, while it lies open to the southern sun and the soft sea breezes of the beautiful bay on which it is built. The cultivated slopes are richly covered with verdure and studded with elegant villas. The whole landscape forms a beautiful picture, the rich meadow lands of the valleys offering a pleasing contrast to the rugged mountain-tops by which they are hemmed in. There is no trade or bustle, and the whole tone of the place is that of peace and contentment. It is altogether a spot of surpassing attraction, and has been rightly called the Montpelier of Ireland. As a health-resort, Rostrevor has no equal in Ireland during the spring months, as it is at this time of the year that the village is thoroughly protected from the prevailing east winds by Slieve Bân, at whose base it is situated. The hotel accommodation is excellent. The Mourne Hotel, overlooking the bay, is a model of beauty and convenience. Lodgings are plentiful and prices moderate. Travelling can be done by rail from either Dublin or Belfast to Warrenpoint, distant two miles, from which the journey can be completed by tram-car.

The neighbourhood has many places of interest; Narrowwater Castle, built by Sir Hugh de Lacy, in 1212, to protect the entrance to the canal leading to Newry; the residence of the Martin family, where the home rule agitation was originated; Killowen Chapel, where the marriage was celebrated which led to the famous Yelverton trial; Greenore, which is situated on the opposite side of the bay, from which there is daily steamboat communication with Holyhead.

Dr. Vesey reports of Rostrevor, as a health-resort, that the sewerage is good, and that typhoid fever has not been met with for many years; that the water-supply could not be better or purer, as it comes from the mountain. The storage-reservoir is placed 600 feet above sea-level, and the service-reservoir 232 feet, thus giving a pressure of more than 100 lbs. to the square inch. The death-rate is exceptionally low, being only 12 per 1,000, and if invalids were excluded it would be less. The rainfall is above the average of the surrounding country, but on account of the sandy subsoil the surface quickly dries. Ozone has been tested for, and its presence found.

NEWCASTLE.—Next to Rostrevor, in importance as a fashionable watering place in County Down, is the cheerful little town of Newcastle. It is situated twenty Irish miles from Rostrevor, by the shore road, and about the same distance from Belfast by rail. Its permanent population is about 1,000, but during the summer months this may be multiplied several times. It is one of the most picturesque places in this country; standing as it does on a beautiful sandy beach, at the foot of Slieve Donard, the highest of the Mourne Mountains, 2,800 feet above the sea level. There are many beautiful walks and drives in the neighbourhood, including those to Bryansford, Dundrum, Castlewellsan, and Rathfriland. Donard Lodge, with the beautiful surrounding park, the property of the Dowager-Countess Annesley, is one of the chief attractions; and, as it is freely thrown open to the public, it affords an endless variety of scenery, containing, as it does, exquisite landscape gardening, and the most rugged glens, with bold waterfalls.

The hotel accommodation is excellent, both the Annesley Arms and the Bellevue being commodious and well-managed hostelries. There is a Chalybeate Spa Well in the neighbourhood. The town is well provided with pure water. Baths have been erected at considerable cost, they are well fitted up, and contain both hot and cold water. The combination of mountain and sea-air makes this a most desirable summer-resort.

DONAGHADEE.—This is one of the nicest little towns in County Down, having rail to Belfast, from which it is distant 22 miles. It is the nearest port to Scotland, from which it is only 21 miles distant. At one time direct communication was carried on to Portpatrick, but at present the passenger-traffic is diverted *via* Larne and Stranraer. Donaghadee contains a very fine harbour and lighthouse. An old Danish rath, at the end of the town, gives it a picturesque appearance.

In answer to inquiries as to the sanitary condition of the place, Dr. Stuart, the resident medical officer of health, writes as follows.

1. **Sewerage.**—The town is situated on a slope from the upward, which makes sewerage easy, the fall being good in the greater part of the town; there is a sufficient supply of drains, which empty themselves into the sea, and, as it washes the whole front of the town every tide, all offensive matter deposited by the sewers is carried off. A number of the gratings on the drains, along the streets, are of the

old open description, but I have instituted means to have them replaced with stench traps, which will, when done, make the sewerage perfect.

2. **Condition of the Air.**—This is generally mild, the town is well sheltered from the south and west winds, which prevail here in the winter time; east and north-east breezes prevail in spring and summer, which make the air bracing and invigorating, at the very time when strangers visit our town in search of health; even during winter the air is milder than in Belfast.

3. **Water-Supply.**—Though we have no public water-supply from a distance, there is an ample supply from pure springs in the neighbourhood. There are three good pumps erected, outside the town, by the Sanitary Board, and other private pumps, which afford a never failing supply. The water was lately analysed by Dr. Cameron, of Dublin, county analyst, and pronounced by him to be good. The best evidence I can produce, to show the excellent quality of the water, is the absence of any ill consequences to the public health from its use. I have had charge of the dispensary for twenty-five years, and during all that time we had no epidemic of any kind traceable to the use of the water of the pumps; in fact, the town has for many years been so healthy, we have had only sporadic cases of zymotic diseases, and these, "few and far between." I consider we have the cleanest, healthiest little town on the north-east coast.

4. **Death-Rate.**—For the last year, this has been about twenty per thousand.

5. **Rainfall.**—I am informed by Mr. Macgowan, manager of the station here for meteorological observations, that, for the last three months, this has been just 4.5 inches.

There is a very good view of the Scotch coast from the front street of the town; and from the moat in the centre of it, excellent views can be obtained from Cantyre, in Argyshire, to the Mull of Galloway, including Ailsa Craig and the Isle of Man. The town is built in a semicircle, having the splendid quay as a promenade, not surpassed by any in the kingdom. Adjacent to the town are extensive gardens and walks, beautifully kept, which are open to the public, free, every day except Sabbath. These are the property of the landlord, D. Delacherois, Esq., D.L. In the immediate neighbourhood there are two extensive gardens, well supplied with every kind of summer fruits and flowers.

There are, in the summer season, usually six trains each way, between Donaghadee and Belfast, daily.

There are local conveyances, to any extent desired, to be obtained. The old outside car, the modern wagonette, and highland coach, carrying thirty-five passengers each, together with long cars, carrying eighteen persons each, run to Bangor three times daily. These cars are in good demand for excursion parties, picnics, etc.

The town contains one Episcopal church, two Presbyterian churches, one Methodist church, and one Roman Catholic chapel.

In Donaghadee there is one of the best constructed, and extensive baths in the province—the Ulster Baths—containing a large plunge bath, 70 feet square, filled from the sea every tide, also numerous cold, warm, shower, and spray baths, for ladies and gentlemen. Adjacent to the town are many good bays for sea-bathing, in a pure sea, free from the possibility of impregnation by the diluted sewage of the large town of Belfast, which must impregnate other bathing-places nearer the Northern Athens.

An attraction, valued by some, is the existence of a Corinthian sailing club, where well contested sailing matches take place every Saturday afternoon in the summer. Boats can always be had, at moderate terms, for pleasure sailing and rowing, manned by some of the best boatmen in Ireland.

BALLYNAHINCH.—This country district of County Down has a combination of mountain air and spa water, which gives it some reputation as a health-resort; and, for those suffering from rheumatic affections the place offers many attractions, and unquestionably many patients consider that they receive much benefit from a sojourn at this sanatorium. It is situated half way between Belfast and Downpatrick.

BANGOR.—This is, in many respects, one of the most important seaside towns in Ulster, as it is visited by the largest number of persons during the summer months. It is only ten miles from Belfast, on the County Down side of the Lough. It is a very ancient town, having had an abbey destroyed by the Danes early in the ninth century. Dr. Reuben Bolton furnishes the following particulars as to its sanitary condition.

1. **Sewerage.**—A thorough system of sewerage for Bangor is approaching completion. The main sewers throughout the town have been laid down for about a year, but await a sufficient supply of water for efficient flushing from the capacious reservoir just

constructed at a distance of about two miles. The sewer-pipes from all the streets and houses have not yet been connected with the main sewers. When the entire system shall have been completed, the result will be as perfect and effectual an arrangement for the disposal of sewerage by water-carriage as can exist anywhere.

2. *Condition of the Air.*—The air of Bangor is particularly pure and bracing, consequent upon its situation on the sloping and indented southern shore of Belfast Lough; upon its surroundings (except on the seaward aspect) of open country, greatly diversified by alternate hill and vale, with occasional coppice or wood; upon the absence of all manufacturing establishments which could pollute the atmosphere with smoke, or the streams with poisonous filth; and upon the arrangement and steepness of the streets constituting the main thoroughfares of the town, which enable every breeze that blows to circulate freely, and to quickly dry the roads after rain.

3. *Water-supply.*—Hitherto the supply of water for Bangor has been derived from pumps or wells, either public or private. These, with such rain-water as could be stored, have furnished a fairly adequate supply for consumption and domestic purposes generally. The pump-water is pure, and free from organic matter, but, from every source, is hard, containing both carbonate and sulphate of lime in considerable quantities; iron is also present in several specimens. To meet the requirements arising from the rapid extension of the town, and the necessity for a continuous supply of water to flush the new sewerage works, to extinguish fires, etc., an extensive scheme for the provision of an ample water-supply has been entered upon by the sanitary authority, and is now all but complete. The reservoir is stated to be capable of containing enough pure water to furnish a supply of twenty gallons daily to five thousand persons for five months, and is situated on an elevation higher by forty feet than any habitation within the township.

4. *Death-rate.*—The population of the township, or urban sanitary district of Bangor, was returned at the last census as being 3,006. During the year 1884, the deaths registered as having occurred within the district during the first quarter of the year were 14 in number. During the second quarter, there were 13 deaths registered; and, during the quarter ending September 30th, 11 deaths. These figures correspond to an annual death-rate of about 16.8 per 1,000 of the population. It should be understood that, the census throughout the kingdom being taken during February, the population given above, on which the mean mortality is calculated, is that of the ordinary residents. The visitors in summer add enormously to the number of inhabitants; but as they cannot be conveniently reckoned, all deaths, whether those of permanent or temporary residents, are included as indicating the death-rate among the permanent population only, and so make the ratio appear somewhat higher.

Portrush.—This favourite and fashionable watering-place is situated almost at the extreme north of Co. Antrim. It has rapidly risen during the past few years, and has become widely known and very popular, on account of its close proximity to the world-renowned Giant's Causeway, and also from the excellent salmon-fishing to be obtained in the neighbourhood. The coast-scenery is unsurpassed in the world. An electric railway extends from Portrush to Bushmills, a distance of six miles in the direction of the Causeway, and recently powers have been obtained from Parliament to complete the remaining two miles. The sandy beach is one of the most beautiful to be met with anywhere. The sea is rather rough, the water is buoyant, and the air keen and tonic. Dr. Adam Clarke was born at Portrush; a monument has been erected to his memory on a hill overlooking the town. A quay affords accommodation to vessels of small tonnage, and steamers to Scotland leave twice weekly.

The death-rate is 15 per 1,000 of the population. The rainfall for 1882 was 47.65 inches, and for 1883, 44.68.

The following facts on air, sewerage, and water-supply are furnished by Dr. Macaw of Bushmills.

The air of Portrush is pure and bracing. It is a good deal exposed during the winter months. A scheme of sewerage is in progress which, when completed, will be very good. The soil is porous, and dries rapidly after rain. A new and ample water-supply has been recently provided. There are five good hotels, and a superior class of houses, let either in apartments or as furnished houses. The population in winter is 1,500; in summer, from 3,000 to 4,000.

Denluce Castle, midway between Portrush and Bushmills, is a ruin of great antiquity and much interest.

At Portstewart the air is pure and bracing; the sewerage is pretty good; and there is a fair supply of water from wells and pumps. There are two good hotels, and a good strand for promenade.

At Bushmills and Ballintra the air is pure and bracing, the sewerage

is good, and the water-supply fair from wells and pumps. There are hotels at Bushmills and the Causeway, each a mile distant. Bushmills is accessible from Portrush by the electric tramway. There are several furnished houses and houses let in apartments.

The sewerage at Ballycastle is defective, but the water-supply is pretty good. The scenery in the neighbourhood is beautiful. The place is accessible by railway, but there is very little accommodation for lodgers.

The Giant's Causeway Hotel is situated on a commanding eminence close to the Causeway, and is under excellent management, being conducted in connection with the electric railway. To those who want a tonic and invigorating atmosphere, with wild and beautiful coast-scenery, a week's residence here will be thoroughly enjoyable. Of the Causeway itself, it is not necessary to speak here. Being one of the wonders of the world, everyone has a desire to see it. Its curiously formed pavement, its wonderful caves, its charming bays and bold headlands, have been the theme of visitors for more than two hundred years. Time has not deprived them of any of their beauty, nor description made their study any the less interesting.

Portrush being the "Brighton of Ireland," and the Giant's Causeway an unsolved geological problem, with the only electrical railway in the world lying between them, it is not surprising that this is one of the most attractive health-resorts in Ulster.

CASE OF APHASIA IN WHICH THE CHIEF LESION WAS SEATED IN THE SUPRAMARGINAL AND ANGULAR GYRI, BROCA'S CONVOLUTION BEING UNAFFECTED.

By SAMUEL WEST, M.D., F.R.C.P.,

Physician to the City of London Hospital for Diseases of the Chest; Physician to the Royal Free Hospital; Medical Registrar and Tutor to St. Bartholomew's Hospital.

HENRY H., aged 66, a painter, was admitted into the Royal Free Hospital with an attack of bronchitis. Except from occasional attack of gout, he had been in good health until one year ago, when his breath became short on exertion, but he was not laid up until his feet began to swell about two weeks before admission.

The patient was rather stout, but of a sallow pallid colour; the face was slightly puffy, and the legs oedematous; loud rhonchus and sibilus were audible over the whole chest; the heart was extremely feeble, and the cardiac dulness increased to an inch to the right of the sternum; there was no murmur; the veins of the neck were turgid; the liver did not appear to be enlarged; the urine contained a small amount of albumen, and the arteries were hard. The case was regarded as one of bronchitis, with a weak dilated heart, consequent upon granular kidneys.

The patient improved considerably under treatment until January 21st, about three and a half weeks from his admission, when, at 6 A.M., he was discovered by the nurse to be unable to speak. Nothing had occurred during the night to attract attention to him; and, except for his aphasia, he seemed to be in his usual health.

On examination, during the morning, incomplete right hemiplegia was discovered, the loss of power being more marked in the leg. The patient appeared to be in comfort; and, in general health, to be, on the whole, better than before. He was cheerful and happy, but he understood very imperfectly what was said to him, and, in reply to questions, he muttered gibberish, though he often repeated the words "Yes," "Well." The movements of the tongue were free and symmetrical; the pupils were equal, and reacted normally to light and to accommodation. There was no paralysis of the eye-muscles, and the discs were normal. Only a slight loss of power on the right side of the face was to be detected. The urine was passed involuntarily, and the bowels were confined. With reference to the right arm, the note taken ran as follows: "There is a good deal of inco-ordination of the right hand."

January 22nd. The patient's condition was the same, but he had not slept at all. On being asked to put out his tongue, he would move it about in his mouth, but not protrude it, showing that he partly, at any rate, understood what was required of him.

January 24th. For the last two nights the patient had slept well, though to-day he was drowsy and heavy. A condition of incomplete hemianesthesia on the right side was discovered, affecting also the right half of the face.

January 25th. The patient could make use of a few more words, but did not understand completely what was said to him.