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STRATHPEFFER SPA

IN

THE HIGHLANDS.

D. MANSON, M.A., M.D.



Presented

34-1892

STORE

824 - i . 9





*With the Author's (Oxford)
John W. Kendrick.*

THE SULPHUR WATERS

OF

STRATHPEFFER,

IN THE

HIGHLANDS OF ROSS-SHIRE,

WITH DISTRICT GUIDE.

BY

D. MANSON, M.A., M.D., C.M.

FOURTH EDITION, REVISED.

ABERDEEN: LEWIS SMITH & SON.
EDINBURGH: JOHN MENZIES & CO.
STRATHPEFFER: HUGH BEATON.

1881.

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PREFACE

FOURTH EDITION

TO HER GRACE THE

DUCHESS OF SUTHERLAND,

COUNTESS OF CROMARTIE,

THE OWNER OF THE STRATHPEFFER SPA,

THIS LITTLE WORK

IS RESPECTFULLY AND BY PERMISSION DEDICATED.

PREFACE
TO THE
FOURTH EDITION.

THE former editions of this work having met with ready acceptance at the hands of the health and pleasure-seeking public, the author is encouraged to bring forward the present republication. In this, he has carefully revised and considerably added to the last edition. On both chemical and physiological grounds Strathpeffer, as a Sulphur Spa, is shown to be, as has been pointed out in former editions, among the foremost of its class in Europe, and far before any in Great Britain. Prior to railway extension—for a hundred years before—the Spa had enjoyed in Scotland a great reputation, *practically* through the marvellous healing virtues of its waters. Until within the last fifteen or sixteen years, however, writers on Spas were more or less justified in disparagingly remarking on its inaccessibility and its imperfect arrangements; but for such shortcomings it can now no more be blamed. The Strathpeffer Station on the Dingwall and Skye Railway is within a mile of the Wells, and local improvements, on a very extensive scale, recently effected,

and still being carried on, under the immediate surveillance of the agents of its noble owner, the Duchess of Sutherland, fully satisfy every necessary requirement. It is 20 hours by rail from London. The climate is mild, yet bracing and comparatively dry—in a word salubrious, and that in a high degree. To the fact that the good to be derived from the Spa is not confined more to the summer than to the winter months, the author would draw special attention.

~~NEW SQUARE,~~

~~CHESTERFIELD, June, 1881.~~

Esplestone

Strathpeffer Spa

1884

PREFACE

TO THE

FIRST EDITION.

THE present little work, intended specially for strangers visiting Strathpeffer, is an expansion of a pamphlet, "On the Strathpeffer Spa," published for the medical profession some time ago, by the author. In this, he has attempted to render as intelligible as possible to the non-medical mind the subject of the Waters. . In treating the Walks and Drives, &c., he has endeavoured to be concise, rather only indicating them and leaving his readers to go and see for themselves ; and in this latter part of the work, he begs to acknowledge aid mainly from the excellent "Guide to the Highlands," of the Messrs. Anderson, of Inverness.

STRATHPEFFER SPA, July, 1869.

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THE STRATHPEFFER SPA.

PART I.

THE importance of this Spa as a health resort, in several varieties of disease, cannot well be over-rated. Having now attained no little celebrity, and being evidently destined, sooner or later, to occupy a very prominent position among the Spas of Europe, it has a special claim on the attention of the medical profession.

Persons requiring change of air, or the use of such waters as those of Strathpeffer, and who are strong-minded enough to weigh between fashion and fact, and to whom time, money, and long journeys are a consideration, would do well, before rushing abroad, to make trial of this powerful, picturesque, and now easily accessible *Home Spa*, situated as it is, in one of the most beautiful districts of Scotland, with a climate which will bear favourable comparison with that of many pet foreign resorts, and waters among the first of their class in Europe, while it is on the property of a noble family, whose name alone is a guarantee, that neither enterprise nor

money are wanting, in the development of the natural resources of the place.

“The example of the Queen in her visit to Loch Maree” (this queen of Scottish lakes, and now within easy access from the Spa), “in September, 1877, administers,” says a leading journal of that date, “to our roving fellow-citizens a gentle reminder that, while finding enchantment in holidays at a distance, they may be allowing to remain unappreciated, scenery invested with natural and historic associations, not less impressive in their own country. . . . The Queen has always been distinguished by a lively interest in the varied physical characteristics and historic memories of her home dominions, and in no respect are the purity and simplicity of Her Majesty’s tastes more apparent than in the kindly enthusiasm she has long indulged for the Highland scenery of Scotland.”

Strathpeffer Spa is situated about twenty-five miles northwest of Inverness, in the county of Ross, and is pleasantly accessible by omnibus or other conveyance, in a drive of five miles, from the Dingwall Station of the Inverness and Ross-shire railway; or, if the visitor chooses, he may, by changing trains at Dingwall, proceed by the new Dingwall and Skye line to the Strathpeffer Station, a mile from the Wells.

Since the latter part of last century the Spa has been much resorted to by health-seekers, chiefly from the more northerly counties of Scotland; but as facilities for travelling by railway have increased, it has become frequented by visitors from all parts of England and Scotland, the healing virtues of its waters, practically demonstrated in numberless cases, forcing it more and more on the attention of those in quest of health. By nature the place is eminently suited for being the resort of invalids. The village, with its hotels and

lodging-houses, stands at a height of some 200 feet above the level of the sea, on the slope of the western extremity of the strath, or valley, which is called Strathpeffer ; and is just on the margin of the grand mountainous district of Ross-shire, a portion of the Scottish Highlands now well-known to every enthusiastic sportsman. The natural beauties of its situation, and the style of the buildings which have sprung up within the last few years, vividly recall reminiscences of some celebrated foreign Spas. Since the Duke and Duchess of Sutherland have directed their attention to its prosperity, it has completely changed, both as regards appearance and accommodation for visitors. Indeed, under the able and tasteful superintendence of her Grace's factor (W. Gunn, Esq.), who resides at the Spa, the whole valley has of recent years assumed quite another aspect. Hotels and lodging-houses yearly increase, and charges are we think moderate. A considerable extent of ground immediately adjoining the Wells has been set apart for building purposes ; the feus are perpetual, and may be had on favourable terms.

So great has been the influx of health and pleasure-seekers to Strathpeffer, that additional accommodation of a still better kind had become a matter of necessity. The absence of a big hotel to meet every modern requirement was felt to be a want which must be supplied. Some gentlemen acquainted with the merits of the place, and desirous of its success, formed themselves into a Limited Liability Company a few years ago, with the result that there is now in full operation, under the charge of a competent and intelligent manager, the commodious and first-class hotel, "The Ben-Wyvis," named after the grand and massive mountain of that name, fine views of which are obtained from the windows, which also overlook scenery in hill and glen unsurpassed in Scotland. Climatic zones under view

from "The Ben-Wyvis" range from 30 to 3400 feet above the sea-level. The hotel comprises spacious dining and drawing-rooms, private sitting-rooms, with bed and dressing-rooms *en suite*, billiard and smoking-rooms, &c. It affords every modern comfort and convenience, with thorough ventilation and drainage. It stands within its own grounds (about seven acres), which are tastefully laid out, and contain tennis and croquet lawns and bowling green. It is within two minutes' walk of the Spa, and Post and Telegraph Offices. "The Ben-Wyvis" is specially adapted for a winter and spring residence, being heated by means of Taylor's system of coil pipes, by which an even and comfortable temperature (of about 60° F.) is maintained in the colder seasons; a fact of much importance, as the use of the mineral waters in the winter as well as in the summer months is of the utmost advantage. The tariff at this hotel is fixed at a most moderate scale, and varies, of course, according to apartments and length of visit; a considerable reduction is made to visitors who come out of what is termed "the season." Posting, in connection with "The Ben-Wyvis," is ample and complete, and there is accommodation for the horses and carriages of those who bring their own.

Strathpeffer is a central point from which excursions can be made to Skye, Strome Ferry, the now famous Loch Maree, Dunrobin Castle, and many other places of interest (see Part II).

The "Strathpeffer" and "Spa" Hotels are well-managed houses.

Families preferring private lodgings may find suitable accommodation in comfortable villas.

The village is well sheltered by high hills on the north, south, and west sides, the Ben-Wyvis range of mountains protecting it from the north. In the easterly direction it com-

mands a beautiful view of the cultivated valley, with its wood and heath-clad hills rising on each side. The scenery of the district is of the most varied and picturesque description, combining mountain, loch, river, frith, wood, and cultivated country. The whole neighbourhood is interesting to the geologist, botanist, and entomologist, and from many and many a standpoint is deservedly worthy of the brush of a Millais or a P. Graham. The clearness of the air has at times a peculiar effect in increasing the visibility of objects, producing the impression of nearness. Between the hills, during stillness of the atmosphere, we may remark also that the audibleness of sound is observedly increased. There is the most ample scope, for patients who are able, to benefit by out-door exercise and air. They may enjoy either the lighter amusements of the pleasure grounds connected with the Spa, and an endless variety of walks in the immediate neighbourhood, or, if inclined for more active exercise, they may have it to any extent in rambles among the adjoining hills. There are numberless places admirably suited for pic-nics.

In the event of rain falling, patients may still enjoy the advantages of walking exercise in the Pump-room buildings or under the verandahs. The principal Pump-room was some years ago enlarged, and all the springs brought to it, and among other improvements, a public Promenade-room or Hall added, which is used also as a Concert-room and for other amusements; but the new Pavilion, now being built at great cost, will be *the grand* attraction of the future. From its Hall and Grounds there will be splendid views. The Hall will be 100 feet by 40, and it is intended that there shall be in connection with it refreshment room and billiard table.

As regards the Spa itself, we are gratified to find that it is no longer let to a tenant, whose object naturally would be

to make the most out of it. His Grace the Duke of Sutherland, with that practical judgment which he is so well-known to possess, has decided on taking it into his own hands, placing its management under officials directly responsible to himself; and we are pleased to remark that already this arrangement has borne good results, among many improvements effected, being the introduction of douche, vapour, and galvanic baths, inhalation-room, and other appliances.

Omnibuses run (at present) between both Dingwall and Strathpeffer Stations and the Spa three times a day; also between the principal Hotels and the Strathpeffer Station in connection with up and down trains.

There are two despatches and two deliveries of letters daily. The Post and Telegraph Office is close to the Wells.

A Reading-room and Library were recently provided.

The Village is well supplied with wholesome water from springs rising among the heath-clad hills close-by, and the sewerage system is thorough, having recently been made so.

The Spa is 20 hours by rail from London, 10 from Edinburgh, about 10 from Glasgow, 7 from Perth, and 2½ from Strome Ferry.

CLIMATE.

The climate of Strathpeffer, though perhaps a little variable, is eminently salubrious. It may be set down as dry and bracing. In the "Statistical Account of Scotland," for 1841, it is represented as being "one of the purest and most salubrious in Great Britain." Figs come to maturity in the open air in gardens in the district. After rain the soil is very quickly dry. The air of the lower part of the valley is mild and pleasant, that of its higher localities peculiarly bracing and pure, resembling not a little in purity the air of the

Engadine, without of course its rarity. Thunderstorms are infrequent. As regards cold, judging from our own experience, it is felt much more in the centre of England than at Strathpeffer. The people of the district are healthy and long-lived. Consumption among them is a rare disease. Mountain climates have of late years attracted considerable attention as fit health-resorts for the milder forms of consumption. In the highest inhabited valleys of the Peruvian Andes, consumption is said to be unknown, while the inhabitants of the high Pyrenees, and some of the Swiss Alpine valleys, are remarkably exempt from it—owing, no doubt, to the dryness of the soil on the hill-sides, as well as the mountain air. At St. Moritz, where the saying is, that they have nine months winter and three months cold, consumption is said to be unknown. The rarity of the atmosphere and frequent climbing necessitate a greater and therefore a healthier play of the chest in the oxygenation of the blood.

The district between Strathpeffer and the West Coast of Scotland, some fifty miles, being entirely mountainous, the Spa is well protected from winds charged with moisture from the Atlantic. It has been said, and not untruly, that “no where is the season of spring—everywhere delightful—half so charming as in the Highlands,” and at no time of the day, we would add, so much as *in the early morning!*

In Ross-shire, the rate of mortality per annum is sixteen to each thousand of the population, being seven less than that of London as London now is. The rainfall in the Strathpeffer district ranges from 25 to 30 inches. The average for England and Wales is 35 inches.

MINERAL WATERS.

The Strathpeffer mineral waters are, with the exception of a mild chalybeate, of the kind called sulphurous, being richly impregnated with sulphuretted hydrogen gas and sulphur. They contain various saline ingredients, and are cold. They have been analysed by Dr. Murray Thomson, late of Edinburgh, Dr. Medlock, of London, the late Dr. Thomson, of Glasgow, and others. Being sulphurous, they belong to the same class as the sulphur-waters of Harrogate, Moffat, and Aix-la-Chapelle. The sulphur-element, however, in one or other state, enters more largely into them than into any of these. It exists in combination with hydrogen, forming sulphuretted hydrogen gas, and as an element in several sulphate-salts, forming the sulphates of magnesia, lime, and soda, and as a sulphuret in combination with potassium, sodium, and iron, and by itself in a state of suspension. Strathpeffer is unique among the first sulphur Spas of Europe for the quantity and condition of the sulphur-element over and above the sulphuretted hydrogen gas. The presence of fine sulphur in suspension is peculiar to it, and the sulphur so suspended appears to be "crowded out" of chemical combination owing to the amount of it in the water. (See Contents—"Origin of Constituents of Sulphur Springs"). There exist altogether in the water of the Strong or New Well, the sulphates being taken into account, a little over thirty grains of sulphur to the imperial gallon. In the strongest sulphur-water of Harrogate, the quantity of sulphur is some eight grains to the gallon; while in the Moffat water it is little more than two-thirds of a

grain ; the sulphur in the two last being in combination with hydrogen and sodium only, forming sulphuretted hydrogen gas and sulphuret of sodium. The Aix-la-Chapelle waters contain four grains of sulphur to the gallon. They, however, are hot, which so far increases their power ; but a cold sulphur-water can of course be artificially heated, and *its* power also so far increased.

With regard to the quantities of sulphuretted hydrogen gas, it will be seen by reference to the analyses that while the strongest Harrogate water contains 5·31 cubic inches to the gallon, and the Moffat a little over a third of a cubic inch, the Strathpeffer New Well contains 11·26 cubic inches, which is the largest quantity of sulphuretted hydrogen in any known spring in Great Britain. In most of the sulphurous Spas of the Continent comparatively little of this gas is contained, and a water which contains one cubic inch to the pound is considered a strong one. Strathpeffer contains more than this. Aix-la-Chapelle has the gas represented by only 0·78 grains of sulphuret of sodium to the gallon.

The predominating *saline* ingredients in the Strathpeffer waters are, the sulphates of lime, magnesia, and soda, and the carbonate of lime. In the sulphur-waters of Harrogate, Moffat, and Aix-la-Chapelle, the predominating salt is the chloride of sodium (common salt). The salts in the Strathpeffer springs do not so exist as to render them very markedly aperient. The waters are of low specific gravity, and their action is more especially on the kidneys, on which they act with very great energy and promptitude. In this particular, they resemble the weak Moffat sulphur-water, and differ widely from the strongest Harrogate waters, in which the chloride of sodium exists in such abundance as to render them aperient when taken in much smaller quantities. In chemical composition, the Strathpeffer sulphur-water re-

sembles those of Eilson in North Germany, Nenndorf in Hesse, and Schinznach, the celebrated French resort in Switzerland. The free carbonic acid, however, largely present in them, has not been determined in it. The famous sulphur Spa of Aix-les-Bains in Savoy may be superior at present to Strathpeffer for bathing purposes, but the Strathpeffer waters are the more powerful of the two for internal use. The *total* saline ingredients in the waters of Strathpeffer are very much less than in those of Harrogate; the waters are thus of less specific gravity. On this account they are more easily digested, their special tendency being to be *absorbed* by the stomach and intestines, and received *through the liver* into the general system, the higher dilution and the salts of lime and iron favouring this absorption; the tendency of the Harrogate waters on the other hand being, by acting as aperients, to pass through the bowels, and that too though taken in comparatively small quantities.

Owing to the *easy digestibility* of the Strathpeffer waters, and their prompt action on the kidneys, large and frequent draughts of them can be taken; and the greater the amount received into the system, the greater must be the specific influence of the all-important sulphureous ingredients present in them. We have known of twenty, and heard of fifty and sixty glasses of the water being taken without discomfort in a day; but we would not be understood to allow, that the greater the amount imbibed, the greater will be the benefit to the patient. The quantity usually drunk is from forty to seventy *ounces* a day; but the amount varies according to the constitution and complaint of the patient, and should be regulated by a medical man conversant with the effects of the waters.

The Strathpeffer waters are thus not only greatly stronger in sulphur and sulphuretted hydrogen than the strongest of

the Harragate waters, but they can be taken in much larger quantity, in many cases, indeed, almost *ad libitum*. They should, therefore, be surpassingly powerful as curative agents in those diseases for which sulphur-waters are generally recommended.

Although the water is at first somewhat repulsive in odour and taste, it soon becomes by a little perseverance quite palatable; the smell disappears, and to many its sharp coolness* renders it in the heat of summer even refreshing.

“The season” extends from the beginning of May to the end of October, but this is simply the time of year when people generally go from home for change. As far as the water is concerned, it may be drunk with the greatest advantage in the winter as well as in the summer; indeed, throughout the whole year, the chill at any time being, if required, taken off by the addition, at the time of drinking, of a little hot sulphur or ordinary water. It ought not to be heated over a fire, as the gradual heating dissipates the sulphuretted hydrogen gas. The *steam* gradually generated in the water fills its minute interstices, and expells the gas.

The water may be sent or taken to a distance, but the sulphur-gas has a tendency to escape even from sealed bottles. The full medicinal advantage is obtained, therefore, only at the Wells.


The different sulphur springs contain much the same chemical ingredients, and differ mainly as to quantities. From the quantity of lime which they contain, they may be classified with what are termed earthy springs, like those of Bath, and Baden in Switzerland, while from their chief saline contents being sulphates, they may also be said to belong to the aperient, bitter, or sulphated class, like that of Friedrich-

* Owing to the presence of carbonic acid gas as well as low temperature.

shall, in which, however, the sulphates exist in much larger (purgative) quantity.

There is a well-arranged and superior sulphur bath establishment at the Wells, where ordinary hot, cold, and shower baths may also be had; also vapour, douche, and galvanic baths. Sulphur water for the baths is supplied from a large covered-in reservoir, lately constructed for the reception, all the year round, of the waste water of the several springs. If required, by enlarging this reservoir, the supply for baths can be increased to any extent.

A new and abundant supply of sulphur water having lately been discovered, an additional range of baths is at present being constructed. Recent sinking and excavating operations have demonstrated that great part of the valley is actually permeated with sulphur water. Any amount may therefore be had, and new springs may in time be found, better than the old, both for drinking and bathing purposes. Of old the baths were metallic, which was a chemical mistake; they are now of clay, lined with porcelain. There is a large sunk bath for the use of invalids unable to get into the ordinary kind, with apparatus by which they can be gently lowered into the bath, and raised again without fatigue, or painful handling by the attendants.

 The chalybeate water brought in iron pipes from Saint's Well (See Part II.), side by side as it now is with the sulphur waters in the principal Pump-room, must be looked upon as a valuable acquisition to the Spa, iron being an essential element of the blood, enriching and strengthening it, and at the same time acting as a powerful tonic to the digestive mucous surface, liver, spleen, and skin. "The blood is the life," but in order to "life," both mental and physical, the blood as a rule must be healthy and strong. The iron in the water is obtained from the rocks or soil in the neighbourhood of Saint's

**now highly effervescent*

Well, where it occurs in an oxidized state. It forms a carbonate by uniting with the carbonic acid gas which is always present in good spring water.

As to *charges*, we do not know any other Spa where they are so moderate.

ORIGIN OF THE CONSTITUENTS OF THE SULPHUR SPRINGS.

These are to be referred, partly to the solvent action of the rain-water, during precolation through calcareo-bituminous rocks in the vicinity of the Wells, and partly also to chemical changes occurring among the materials taken up by the water. An analysis of a specimen of the rock by J. Ross, Esq., of Alness, gave the following composition :—

	Per Cent.
Bituminous organic matter and water	4·8
Sulphate of lime	10·3
Carbonate of lime	45·0
Carbonate of magnesia	19·1
Carbonate of iron	1·6
Insoluble (silicates, &c.)	18·8
	—
	99·6

The sulphates of magnesia and soda present in the springs, probably exist in a diffused state in the rocks, their presence in a small specimen not being appreciable. This remark applies undoubtedly to the chloride of sodium. But the sulphate of magnesia may also result, in part, from the decomposition of sulphate of lime and carbonate of magnesia, carbonate of lime being meanwhile also formed. The sulphuretted hydrogen gas is the result of the partial decom-

position of the sulphates in the water by the organic matter of the rocks. The carbon of the organic matter unites with the oxygen of the sulphates to form carbonic acid, while the sulphur of the sulphates combines with the different metals to form sulphurets. The sulphurets are then decomposed by the carbonated water (it having this effect), their sulphur combining with the hydrogen of the water to form *sulphuretted hydrogen*, while the metals unite with the oxygen, and form carbonates by union with carbonic acid.

The sulphurets in the waters most probably originate in this process, or they, and the sulphur in suspension, may result from the decomposition again of the sulphuretted hydrogen gas. The sulphate of lime (gypsum) would be got chiefly from the rock, but might also result from a decomposition of the sulphur gas. The trace of phosphorus would be derived directly from the Fish-bed Schist, fish yielding this element, though minute quantities of phosphoric acid are met with in almost every spring. Before and during storms the waters curiously darken, sometimes becoming even inky in appearance, probably from increased evolution of carbonic acid gas, (the result of diminished atmospheric pressure) and the formation of the black sulphide of iron. By adding the chalybeate to the sulphur water, a black inky mixture is obtained, from the union of the iron with the sulphur, the black sulphide of iron being the result. In a similar way the motions of the bowels of those taking *the chalybeate water* become dark, owing to chemical union between the iron and sulphur of sulphuretted hydrogen in the bowels, or to the union of the iron with tannic acid, which occurs in tea, coffee, wine, &c.

ACTION OF THE SULPHUR WATER ON THE SYSTEM.

Being sulphuretted and sulphated, it acts as a stimulant to the muscular movements of the stomach, and to the muscular, peristaltic, or worm-like motion of the bowels, by which their contents are propelled. Probably its coolness, and the presence in it of carbonic acid gas would contribute to the natural movements of the stomach. Received into the general circulation, it acts as a stimulant to the nervous system and to the skin. In most cases its action on the nervous system is not such as to be "felt" by the drinker, but in some, a distinct feeling of exhilaration is experienced, while in others, drowsiness some time after partaking of it is most marked. This is caused by the large amount of sulphuretted hydrogen gas, aided by the phosphorus, carbonic acid gas, and sulphate of lime, the effect being somewhat similar to that of alcohol, or of carbonic acid gas when largely ingested in aerated drinks. In its action on the skin also, the effects of the water are comparatively seldom such as to be felt, but if a smart walk be taken after drinking a glass or two, an unwonted feeling of heat with perspiration will, in most cases, be experienced (and in such cases the patient should avoid "taking cold," by not sitting or standing long in cold places). It has the effect of deriving the blood to the skin, and of stimulating the circulation in it, increasing in so doing the skin's natural excretion. This is the effect mainly of the sulphur-element in the water. Even the sulphate-salts in such weak solution appear from experiment to contribute to this effect. The water also aids in the nutrition of the skin, by supplying it with sulphur—one of

the elements of which the skin is composed. The skin is, therefore, not only stimulated in its excreting function, but it is also invigorated, both by the afflux of blood to it and by the supply of one of the constituents of which it is composed. We have frequently observed, during a course of the water, the skin, especially of the hands, to become harder, and its cuticle or outer layer to be shed in "scurf" before the advance of one new and stronger. Over the rest of the body the same process goes on, though rarerly in an appreciable degree. On the face, the action of the water is that of a cosmetic. It has been observed by some who have taken it extensively for some time that, on their underclothing being shaken over a fire, the impurities derived from the skin have burned with a blue colour, like particles of the flowers of sulphur, a somewhat extraordinary fact, which proves at once the strong sulphurous impregnation of the water and its relation to the skin. From the formation of the black sulphide, silver frequently becomes blackened in the pockets of those taking the water. The sulphuretted hydrogen, which is thrown out in part by the skin, becomes decomposed on meeting with the air, its hydrogen combining with the oxygen of the air to form moisture, the sulphur being precipitated pure on the clothes, &c. Pure sulphur is deposited visibly, in the same way, on the surface of the water in the Wells, forming what is called the "cream."

So far the water may be said to act as a stimulant at once to the bowels, the kidneys, the nervous system, and the skin. It is aperient to some extent, the water of the Upper Well being most so. By occasionally confining itself in its action to the kidneys, or to the kidneys and skin, it induces constipation, when some gentle auxiliary purgative should be had recourse to. In such cases the natural aperient salts of the water, which can be obtained at the Spa, may be added

artificially to it, or some other natural laxative water, such as the strong sulphur water of Harrogate, or the Friedrichshall water, or the Hunyadi János, or Püllna, might, under medical advice, be used. The water taken before breakfast has a greater aperient effect than after.

With regard to the *medicinal* properties of the sulphur-water, one of the earliest and most marked effects accompanying a course of it, is a quickening of the appetite ; and this, it may be said, takes place in every instance in which the water is fully admissible. A stimulant influence being exerted by it on the presiding nervous system, functional energy is thus excited in the organs of digestion. But the action of water alone on the system when taken largely being, as proved by experiment, to increase the general waste of tissue, increase of appetite results, in order to the compensation of this waste ; while increased excretion from the skin, kidneys, and lungs, stimulates to increased absorption at the bowel, as exhalation from the leaves of plants stimulates to absorption at their roots. The waste of tissue caused by the use of ordinary water resembles that caused by respiration, and is greatest in the case of structures feebly organized.

In the many forms of deranged and painful digestion (dyspepsia), and diseases resulting therefrom, the use of the Strathpeffer water is attended with the best results. Other causes besides the above operate in the production of such results. The water, while exerting a stimulant action on the stomach and bowels, in the propulsion of their contents, and acting to some extent as a laxative, also fluidifies, and so facilitates the flow of the bile (nature's own aperient), the due elimination of which from the liver *into the bowel* is essential to healthy digestion. At the same time, the change of air and scene, the freedom from business, and the outdoor amusements and exercise, from the stimulus they afford

to the presiding nervous system, and to the system in general (the liver in particular), play no unimportant part, by causing the blood to circulate more briskly through its accustomed channels. "Poor eaters" coming to the Spa are better not to have "something on their minds." Care ought to be left behind. That the water by itself is effectual in quickening the appetite and improving digestion, is attested by the fact that the people of the district, and others at a distance to whom it is sent, experience these effects from its use. In order, however, to permanent good, care should be taken both as regards quantity and quality of food. The greatest advantage also results from the use of the water in such affections of the liver as are of a curable nature. During the natural process of digestion, the dissolved parts of the food, on being absorbed by the bowel, mix with the blood of a large (too often overloaded)* vein (the portal), by which they are conducted to the liver, there, while circulating through it, to be acted upon, so as to be fitted for nourishing the body previous to entering the general circulation; the fatty matters being nearly all conveyed to the blood by a different channel called the thoracic duct. A quickened digestion, following upon increased appetite, must therefore cause increased action in the liver, the circulation through it being meanwhile repeatedly facilitated by the water (as oft as it is drunk), acting as a *diluent* to the blood of the portal vein—for *the water*, on its absorption, is conveyed to the liver by this vein. Sluggish conditions of the liver are in this way improved, and abdominal venous fullness counteracted. The liver tends to become enervated and collapsed by studious and sedentary occupations, and loaded or more or less blocked by ease and luxury, and such condi-

* Overloaded too often by immoderate eating or drinking, or both.

tions of the organ give rise to innumerable dyspeptic woes. Muscular exercise tends to counteract a stagnant condition of liver-circulation, and at the same time promotes a more thorough oxygenation of the blood. In the affection called "piles," which is the result of a dilated condition of what are called the hæmorrhoidal veins, the use of the water is frequently of much service, the dilated state of these veins being almost invariably the result of sluggishness of the liver, or habitually constipated bowels, or both conditions combined. "A specific influence" over the liver and hæmorrhoidal veins, is ascribed by Professor Pereira to sulphuretted hydrogen water. The moving force of the blood through the portal system of veins (liver-circulation) is augmented in the case of the Strathpeffer water by its diluent, stimulant, and tonic properties.

It is now well known that enlarged livers undergo diminution under the continued use of sulphur-waters.

In cases where the bile, which is secreted by the liver, and is a somewhat viscid fluid, may have difficulty in finding its way from the liver into the bowel, it is evident that the water, by acting as a diluent to the fluids of the liver, will tend to favour its flow, and so be useful *in jaundice*.

In cases generally of "sluggish liver" the water by causing increased action of that organ will in this way cause *increased formation of bile*, facilitating at the same time, as we have already pointed out, the flow of the bile from the liver into the bowels.

In *scrofulous affections* generally, the use of the water, especially of the varieties containing traces of iron, is attended with the best results—alternately with it at times, though not in close sequence, the use of the chalybeate water. These affections depend on a weak and unhealthy nutrition of tissue, the result of a weak and unhealthy condition of

blood; this again, being the result mainly of faulty digestion. There is a lack also of iron in the circulating fluid; it is habitually *thinner* than it ought to be. Now, under the influence of the water, digestion being, as we have seen, improved, and there being a strong pure air to breathe, a healthier condition of blood than before is brought about, the result of which is a *healthier nutrition*, or, in other words, a healthier deposition of tissue. Scrofulous affections and consumption are both the result of unhealthy and feebly vitalised depositions from the blood, these depositions having a tendency to increase in size, unless arrested in their progress by treatment, or got rid of by absorption. Now the sulphuretted hydrogen appears to stimulate the lymphatic or *absorbent circulation*, while the water facilitates it by rendering the lymph thinner. In consumption the unhealthy deposition takes place in the lungs; in scrofula, the glands of the neck and abdomen, the bones, eyes, and other parts of the body are affected. The deposited matter, wherever present, if not arrested in its increase, or got rid of by absorption, tends at length, by acting as a foreign body, to produce a sore, and to be discharged, where this is possible, in a broken-up state along with the discharges of the sore. When the deposition occurs in the glands or bones, the use of the water is often attended, as we have said, with the best results; but if it occurs in the lungs, in other words, if the case is one of consumption, *experience* has shown its employment to be attended with the most disastrous consequences. Visitors who may come to the Spa, with symptoms of consumption, are at once cautioned by the people of the place against taking the water. From accounts gathered, its tendency in these cases would appear to be, to cause *exhausting waste* of the tissues of the body, more especially of the fat, also perhaps of the corpuscles of

the blood, the waste caused by it being always greater in weakly than in more robust individuals. It would also tend to increase the sweating and diarrhœa which usually attend consumption. One of the purposes of the lungs in the economy is, to eliminate from the blood carbonic acid. Under the influence of the water, the amount of this acid in the blood is increased, as the result of increased waste of tissue. Increased eliminating work would, therefore, be required of the lungs. But there is good reason for concluding that the sulphuretted hydrogen is also in part thrown off by the lungs. Too much eliminating work being thus thrown on the already diseased organs, would tend to induce congestive or inflammatory afflux of nutrient blood to their healthy parts, and so to aggravate the symptoms. At the same time, owing to the large quantity of the water *sometimes* taken, the temporarily increased volume of the circulating blood would strain the tension of diseased blood-vessels in the lungs, and so favour their rupture and the "spitting of blood." Possibly the water also taken cold, might throw the blood to some extent from the lower parts of the lungs on the upper, when localized consumption is usually present. Hot sulphur baths, however, under medical superintendence, are indicated, accompanied with the internal use of the chalybeate water. *Very small quantities* of the sulphur water taken warm, and occasionally, but not close upon the chalybeate, might not be out of place. Here, however, a medical man should be consulted. The inhalation of the steam, impregnated with the sulphuretted hydrogen gas, is useful in chronic inflammatory affections of the air passages, if not in incipient phthisis.

It is, however, for the cure and alleviation of chronic rheumatic affections, chronic and rheumatic gout, and obstinate cutaneous diseases, that these waters are more

especially renowned. The grand indications to be fulfilled in the treatment of these diseases, speaking generally, being, to obtain a healthy digestion, with increased excretory energy, it must be evident, from what has been already said, regarding the action of the waters on the digestive organs, skin, and kidneys, that they are admirably adapted to meet these requirements. From experiments by Dr. Mosler, of Giessen, both with ordinary water, and with the bitter water of Friedrichshall, we may safely conclude that the effect of the Strathpeffer water is, notwithstanding increase in the carbonic acid, to diminish acidity in the blood—an accompaniment of both gout and rheumatism, uric acid occurring in excess in the former, lactic or other allied acid being present in the latter.

We have very often observed gouty deposits (of the urate of soda), causing enlargement of the joints, undergo diminution under the use of the water, until no trace of enlargement could be recognised. Hot sulphur-water douches to the thickened joints, in such cases, act as valuable auxiliaries, by stimulating the circulation of the blood in the parts, and so favouring the absorption of the morbid deposits, the water drunk meanwhile promoting the retrogressive metamorphosis of the diseased structures. *Judicious* kneading and rubbing of the affected parts are also of use.

The great efficiency of sulphur water in skin diseases is well known. How often are *they* the result of dyspepsia or gout, of syphilis or scrofula, or some morbid state of the blood. Sometimes the skin alone may be at fault, at other times the kidneys alone, but very often it is the digestive mucous tract, the functional activity of each and all of which we have seen that the water powerfully increases. The presiding nervous system also, if enfeebled, would in each case make matters worse, a loss of nervous power being occasion-

ally the only cause to which diseases of the skin can be attributed. Now, the water acts at once as a stimulant to the presiding nervous system, as a corrective of impaired function in the digestive canal and liver, and as a purifier of the blood. "Most of the diseases of the skin," says Dr. Copland in his "Dictionary of Practical Medicine," "especially those which are most disposed to become chronic, are induced, or perpetuated, or both, not only by impaired depurating function of the skin and its follicles, but more especially and remarkably also, by imperfect action of the kidneys, and of the intestinal mucous surface and follicles; the effete and nitrogenised elements and materials, and their combinations, *retained and accumulating in the blood*, irritating the cutaneous capillaries of predisposed and sensitive surfaces and tissues." Very many cases might be adduced to prove the remarkable curative power of the Strathpeffer waters in the above complaints. Provided they are fully admissible, and have fair play under judicious medical advice, their employment can scarcely fail, sooner or later, to be productive of good, while, by combining their external application in the form of bath with their internal use, their curative powers are much increased. Warm sulphur baths are peculiarly exhilarating, and at the same time stimulating to the skin.

The tendency of the water also is to leave *a permanently good effect* in those diseases for which it is employed.

During winter, warm baths of the water are especially indicated. "Wild bäder" are among the specialties of Baden-Baden. These are marble basins filled with mineral water, and containing a quantity of sand and finely powdered granite, with which the bather rubs the surface of the body, and so increases the amount of that skin-stimulation which is one of the main objects of baths of all kinds. Strathpeffer

valley abounds in both fine and rough sand which may some day be made use of in this way.

Mr. Sherlock, in his series of "Hints for the Holidays," says:—"Our own eyes have seen naturally strong men bowed down and crippled with rheumatism, who were almost daily gaining strength and elasticity of limb at Strathpeffer." Patients, however, whose systems are surcharged with morbid material, must not expect great benefit from a short trial of the water. Patience in such cases must be exercised. The water must be allowed *its* time, nor must too great doses be taken because of only a short visit.

But when in any case a prolonged use of it is required, it is by no means necessary that the patient make a continuous stay at the Wells. He may with benefit to himself occasionally intermit for a time its use, and take a course of the chalybeate water, if so advised by his medical attendant, or return home, or go and enjoy other changes of air. In the last case, he might take a run through the western hills of Ross, by the grandly picturesque Dingwall and Skye Railway to Loch Maree, unsurpassed in wildness and grandeur by any freshwater loch in Scotland, (visited by the Queen in 1877); or make a visit to the sublime grandeurs and other attractions of Skye; or to Cromarty, the native place of Hugh Miller, and the district around, where, as a mason, he commenced his illustrious career, and accumulated the materials of his "Old Red Sandstone;" or make a tour through the glorious mountain scenery of Sutherlandshire; or have a trip through mountain and flood by the Caledonian Canal.

During a continuous course of the sulphur water, although the consumption of food is much increased, the weight of the body is, as a rule, more or less diminished; but when its use is left off, the weight of the body rapidly increases,

repair gaining ground over waste, while the functions of the various organs previously acted on continue still to be performed with increased energy. It frequently happens that more good is experienced *after*, than *during* the use of the water. In very inveterate cases, successive annual courses of it might be necessary, in order to a complete and permanent cure. A single course should, as a rule, extend to about six weeks. In some inveterate cases of psoriasis, we have found it necessary to alternate the water treatment with medical treatment.

Syphilitic affections, owing to the expulsive energy of the water, as at Nenndorf, frequently appear aggravated by it at first, but its use being still persevered with, they generally ultimately succumb. It is useful as a diagnostic in this way in obscure syphilitic conditions.

Patients afflicted with diseases of the skin should not be discouraged if sometimes the disease appears aggravated at first; the aggravated condition only proves that the water is throwing out the *materies morbi* from the system, and that an ultimate cure may the more certainly be expected. In gravelly deposits, and inflammatory affections of the urinary passages, the employment of the water is attended with the best results. Small urinary calculi and gall-stones, as might be expected, are frequently dislodged, and got rid of under its influence. Owing to its influence on the digestive organs and skin it acts *as a preventive* to the formation of both urinary and biliary calculi, and is much to be recommended after operation for "stone" in the bladder, or the passing of gall-stones. In diseases of the bones, and in white swelling, its curative powers are indeed marvellous; and here, no doubt, the salts of lime and the phosphate salt* play an im-

* See Analysis.

portant part, they being naturally and largely used in the economy for the building up of bone. We believe the water to be useful in the disease called rickets. In cases of nervous exhaustion, a sojourn at the Spa, with the use, in some cases of the chalybeate, and in others of the sulphur-water, is accompanied with much good.

We have already alluded to the tendency of the sulphur-water to leave a *permanently good effect* in those diseases for which it is generally used. This must be referred to the invigorating influence exerted by it on the skin. Its internal action is generally powerfully assisted by its external application in the form of bath.

A naturally weak skin, or powerful external influences bearing on a strong one, are much more frequent causes of disease than is generally imagined. Damp tends to obstruct the cutaneous excretion, cold to stop it, and to drive the blood from the surface to the interior of the body. If the excretion of the skin is obstructed, compensating action is required in the other eliminating organs of the body—the lungs, liver, digestive canal, and kidneys, and if cold has also operated, and reaction been defeated, the weaker of these in the individual case, being already more or less surcharged with blood, and having their own and the compensating function to perform, would give way, congestion or inflammation being the result. If damp alone has operated, there might still be more work for the other organs to accomplish than the weaker of them could manage, and the same results would follow. The yielding of the liver, or digestive canal, would give rise to irregular digestion, liver affection, or diarrhoea; of the lungs, to “a cold,” or to inflammation of the air-passages; of the kidneys, to disease of these organs. In chronic rheumatism, the parts affected are the denser tissues of the body, such as the coverings of

the muscles, their tendons, the coverings of bones and nerves,* and the ligaments of joints; the poisonous cutaneous excretion is thrown back on these, and irritates or inflames them. Now, the tendency of the water is, to cause invigoration of the skin, and by training the blood to circulate freely in it, to give it permanent strength to resist trying external influences, and so to defend the body against many or most of the ills to which flesh is heir. In this way, it enables the body to resist the effects of winter, and not only to resist but also to expel many of the diseases attributable to the inclemency of that season. Owing, no doubt, to the influence of the water in improving the state of the blood, and in stimulating and invigorating the skin, its use in ulcers and other ill-conditioned sores is attended with the best results. We have been repeatedly much struck with the speedy healing influence exerted by it in ulcers of the leg, depending on a varicose state of the veins, and that too in cases which for months previously had baffled all the ordinary methods of treatment.

In chronic metallic poisoning, its tendency would be to eliminate the poison and promote recovery. As might be expected, it is useful in mercurial syphilis.

Having thus attempted an explanation of the therapeutic action of the sulphur-water, we now sum up with a list of the principal diseases for which we cannot too highly extol its use. They are—uneasy, heavy and painful digestion, want of appetite, bilious conditions, sluggish liver, and all other curable affections of the liver, constipation, the affection called “piles,” jaundice, gall-stones, scrofulous conditions and scrofulous sores, chronic rheumatism, chronic gout, rheumatic gout, sciatica, skin diseases, syphilis, irritation or

* If *the trunk* of a nerve is attacked, pain is felt *beyond* the affected part, causing neuralgia, sciatica, &c.

inflammation of the urinary passages, catarrh of the bladder, urinary calculi (small), white swelling, diseases of the bones, and ulcers. We might adduce many extraordinary cases which have come under our observation. We could speak of *rheumatic patients*, after years of suffering, completely recovering the lost use of stiff and aching limbs, of their being quite unable at first to grasp the tumbler, of others coming on crutches and going without them—(we remember one poor man being last seen on his way home, running to catch the train, with his old and trusty supports over his shoulder)—of others, suffering from chronic and rheumatic gout, becoming convinced that here, at length, they had found a remedy on which they really could depend to ease their pains and reduce their swollen joints; of melancholic and almost life-long dyspeptics, eating heartily and once again with buoyant spirit enjoying life; of chronic and inveterate skin diseases completely and permanently eradicated; of the old diseased skin being shed in great flakes before the advance of one new and healthy; of the complete restoration of the hair of the head, after it had been quite lost in such cases; of scrofulous disease of the bones and joints being cured, when to the surgeon's eye nothing but amputation could save life; of long-standing and intractable ulcers quickly taking on a healing appearance; of the mechanical expulsion of urinary calculi of such dimensions, that they must, unless either crushed or extracted, have remained in the bladder to increase in size; but we think it must be obvious, from what has been already said regarding the general action of the water, that it cannot but be powerful for good in such complaints.

During our residence in England, we do not remember ever having recommended its use in our private practice without advantage to the patient, which proves that, though

it may be sent a considerable distance, it does not lose much in power.

In many morbid conditions of the human body it might, in its action, be compared in domestic economy to a "spring cleaning" and "white-washing." The mere "change" to the Spa could not of itself bring about the results we have pointed out.

In determination of blood to the head, apoplectic paralysis, confirmed epilepsy, great debility, and as already explained, in consumption, the drinking of the water is contra-indicated. Caution should also be exercised in regard to hot baths of any kind by persons of an apoplectic tendency, or who are troubled with "blood to the head."

In enlargement of the spleen, and in cases of great debility, depending upon, or accompanied with weakness of the digestive mucous surface, or with a tendency to chronic diarrhoea, or with flatulency and hypochondriasis, we have found the chalybeate water of much service (ten to forty ounces a day as the medical attendant may deem proper). Its use is also indicated in all cases of debility accompanied with paleness of the face and poverty of blood. The iron is present in the water (which is thoroughly aërated) as a carbonate. In union with carbonic acid, and held also in solution by that gas, it finds its way into the blood more easily and naturally than in any other state. The chalybeate water should not be taken when the individual is plethoric, as it favours "the making of blood."

Local ascending douches in the form of injection, of both the sulphur and chalybeate waters, may often, especially in some female complaints, be employed with advantage. They ought, however, to be used with care, and under medical advice.

It is always advisable, before using the waters in any way,

to consult some resident medical man. We have known serious consequences frequently to ensue from an ignorant use of them. Mineral waters anywhere should always be *cautiously* used.

The bracing air of the place is very serviceable in cases of debility. Some remarkable illustrations could be given of the powerfully invigorating influence of the climate alone. Debilitated nervous systems regain lost energy under the influence of the climate, combined with the use alternatively of both sulphur and chalybeate waters : twelve hours might be allowed to elapse between a change from a course of the the sulphur to one of the chalybeate, and twenty-four in passing from the iron to the sulphur water.

During a six years' residence at the Spa, we had abundant proof of the great superiority of the sulphur waters over ordinary medicines, in the treatment of those affections for which they are used. They are now being strongly recommended by many of the leading London and Edinburgh physicians. We cannot help believing in them as a "sulphur cure" of the highest order.

To quote again from Mr. Sherlock's "Hints for the Holidays" ; after alluding to the contemplated visit, some years ago, of H.R.H. the Princess of Wales to Strathpeffer, Mr. Sherlock says—"From more than one month's trial of Strathpeffer last year, we, who have tasted Buxton and Harrogate, and sundry equally efficacious Spas, as well as Kissingen and other foreign Spas, emphatically attest that Strathpeffer is, therapeutically, the foremost Spa in the three kingdoms, as our own 'poor feet,' and often hard-worked brain, can well and truly testify."

REPORT ON THE SULPHUR-WATERS OF
STRATHPEFFER, WITH ANALYSES.

BY

MURRAY THOMSON, M.D.

ANALYTICAL LABORATORY, 8 INFIRMARY STREET,
EDINBURGH, Dec. 20, 1860.

The analyses given below were first undertaken solely to satisfy my own curiosity; but afterwards, on finding that they were of some value, I made them part of an Essay on the Mineral Waters of Scotland, which is now in progress of publication.

These analyses were made in the autumn of 1857; the sulphuretted hydrogen being estimated, as well as some other points determined by myself, while I was in Strathpeffer, in September of that year. The rest of the analyses were conducted in the laboratory of the Industrial Museum of Scotland (*vide* Official Report by its Director, the late Professor G. Wilson, for 1858). The samples which I used were carefully collected by myself; those of the Pump-room springs were taken during fair weather; that from the Upper Well the day after a heavy fall of rain. It is said that this upper spring is very easily affected by rain, but I have no evidence of this; on the contrary, I had, in 1859, a second opportunity, during dry weather, of estimating the sulphuretted hydrogen, both in this and the other springs, when I found

the latter amounts correspond very closely with those of my former trials. No doubt, long-continued rains must dilute them.

The Strathpeffer waters deserve a much wider celebrity than they have hitherto enjoyed. They are very valuable in a curative point of view, more especially for chronic diseases of the skin, as well as for chronic rheumatism and gout, for all of which, baths of mineral water are specially indicated. When taken internally, their physiological action is not markedly laxative, but they act fully on the kidneys, and hence their value in many constitutional affections.

The reputation for healing efficacy which these waters have so long had, is well founded on facts, as I have learned after extensive inquiry among the medical men of the district.

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I. PUMP ROOM, NEW WELL. "STRONG."

The water from this spring is by far the strongest in sulphureous impregnation. It has an iron-grey colour when seen in quantity, which I afterwards found proceeded from a small quantity of sulphur suspended as a fine powder. The water had no action on either red or blue litmus paper exposed to its action for more than an hour. When a delicate thermometer was plunged into the cistern, and allowed to remain ten minutes, it showed a temperature of 55° Fahrenheit, the temperature of the atmosphere at the same time being 59°.

I did not determine the amount of free carbonic acid gas in this or the other waters, as I had not the materials for doing so with me.

The amount of sulphuretted hydrogen was twice determined in September, 1857, and once again in September, 1859. On these trials, the quantities given were respectively

4.48, 4.64, and 4.00 grains of this gas in a gallon. The mean of these numbers is 4.34, which, converted into cubic inches, gives 11.26 as the volume of sulphuretted hydrogen in an imperial gallon. The qualitative analysis showed the presence of—*Bases*: lime, magnesia, potass, soda, trace of iron. *Acids*: sulphuric, carbonic, phosphoric, hydro-sulphuric, silicic, and sulphur. Besides these, there was present a very small amount of organic matter.

A gallon of the water precipitated 15.54 grains of solid matter on boiling, which consisted of:—

Phosphate of lime and magnesia	0.50
Carbonate of lime	14.88
Carbonate of magnesia	traces.
	<hr/>
	15.38

Statement of the combined results of analysis:—

Sulphuretted hydrogen gas, in grains	4.34
The same in cubic inches	11.26

Sulphate of lime in grains	50.92
Carbonate of lime	14.88
Phosphate of lime and magnesia	0.50
Sulphate of magnesia	31.08
Carbonate of magnesia	traces.
Sulphate of soda	5.86
Sulphuret of sodium	0.53
Sulphuret of potassium	1.30
Organic matters	1.02
Silica	2.14
Sulphur in suspension	4.07
Chlorine	traces.

112.30

These quantities are those contained in an imperial gallon. The amount of total solids which a gallon contains, as ascertained by experiment, was 1111.93 grains.

The specific gravity of the water at 60° is 1002.46.

I may also add that this water can retain for a long time a good deal of its sulphuretted hydrogen gas. A sealed bottle, opened twenty days after my visit to Stathpeffer, contained this gas in quantity at the rate of 2.08 grains in a gallon, or nearly one-half of what it had at the well.

II. PUMP ROOM, OLD WELL.

This is a much clearer water than its neighbour. On standing, however, it deposits a very minute amount of sulphur. It has no action on either red or blue test-paper. Qualitative analysis showed the presence of—*Bases*: lime, magnesia, soda. *Acids*: sulphuric, carbonic, phosphoric, hydro-sulphuric, and sulphur.

The determinations of sulphuretted hydrogen of 1857 and 1859, gave precisely the same result, namely, 1.60 grains in a gallon, equivalent to, in cubic inches, 4.01.

Statement of the combined results of analysis:—

Sulphuretted hydrogen, in grains	. . .	1.60
The same, in cubic inches	. . .	4.01
Sulphate of lime	. . . in grains	18.89
Carbonate of lime	. . .	7.43
* { Phosphate of lime and magnesia	. . .	0.43
{ Carbonate of magnesia	. . .	1.09
Sulphate of soda	. . .	2.47
Sulphuret of sodium	. . .	0.78
Chloride of sodium	. . .	4.60
Potass salts	. . .	traces.

* The substances contained within the bracket represent the precipitate produced by boiling, which amounted to 8.95 grains in a gallon.

Organic matter	2·66
Silica	0·77
Sulphur in suspension	2·47

41·59

The amount of solid matter contained in a gallon, as ascertained by experiment, was 42·16 grains. The specific gravity at 60° is 1000·93. The temperature at the spring on the day of visit 52°. This water, kept in bottles for twenty-one days, contained 0·35 grain of sulphuretted hydrogen in a gallon.

III. THE UPPER WELL.*

In appearance, this water resembles that from the strong well in the Pump-room. The sediment is not so large, but it is peculiar in containing minute black particles, which I afterwards found consisted of sulphide of iron.

When allowed to act on blue litmus paper, it slightly reddens it. The qualitative analysis showed the presence of—*Bases*: lime, magnesia, potass, and soda. *Acids*: sulphuric, carbonic, hydro-sulphuric, silica, chlorine, and sulphur; also a little organic matter. The sulphuretted hydrogen gas was twice estimated in 1857, and once in 1859, the numbers obtained being, 1st, 1·04; 2nd, 1·05; 3rd, 1·56 grains in a gallon. The mean of these is 1·21, or in cubic inches, 3·03.

The precipitate produced by boiling amounted to 8·24 grains, and consisted of—

Carbonate of lime	6·24
Carbonate of magnesia	1·78
	<hr/>
	8·02

* Now also in the Pump-room.

Statement of the combined result of analysis:—

Sulphuretted hydrogen gas, in grains	1'21
The same, in cubic inches	3'03
Sulphate of lime in grains	23'43
Carbonate of lime	6'24
Sulphate of magnesia	39'18
Carbonate of magnesia	1'78
Sulphate of soda	9'87
Sulphuret of sodium	0'12
Chloride of sodium	4'54
Sulphuret of potassium	0'89
Silica	3'06
Organic matter	2'35
Sulphur in suspension	1'84
Sulphide of iron	1'08
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	94.38

Total amount of solid matter in a gallon, 94.16 grains.
 Specific gravity of the water at 60°, 1001'40. Its temperature at the well 55° on the day of visit.

SYNOPSIS OF ANALYSES
OF THE
STRATHPEFFER SULPHUR WATERS.

In imperial gallon :—*

	STRONG	OLD.	UPPER.
	Grains.	Grains.	Grains.
I. SOLIDS.			
Sulphate of lime	50·92	18·89	23·43
Carbonate of lime	14·88	7·43	6·24
Phosphate of lime and magnesia	0·50	0·43	—
Sulphate of magnesia	31·08	—	39·18
Carbonate of magnesia	traces.	1·09	1·78
Sulphate of soda	5·86	2·47	9·87
Sulphuret of sodium	0·53	0·78	0·12
Sulphuret of potassium	1·30	—	0·89
Silica	2·14	0·77	3·06
Organic matters	1·02	2·66	2·35
Sulphur in suspension	4·07	2·47	1·84
Chlorine	traces.	—	—
Chloride of sodium	—	4·60	4·54
Potass salts	—	traces.	—
Sulphide of iron	—	—	1·08
	112·30	41·59	94·38
II. GASES.			
Sulphuretted hydrogen	4·34	1·60	1·21
The same in cubic inches	11·26	4·01	3·03
Carbonic acid—undetermined.			

* Equal to 160 ounces.

ANALYSIS OF CHALYBEATE WATER
OF STRATHPEFFER,
WITH REPORT ON IT,
BY
DR. STEVENSON MACADAM.

ANALYTICAL LABORATORY, SURGEONS' HALL,
EDINBURGH, July 6th, 1871.

Analysis of sample of water from Saint's Well, Strathpeffer.

One imperial gallon contains:—

					Grains.
Carbonate of iron	...	...	...	...	2·46*
Carbonate of lime	...	...	...	...	3·14
Chloride of sodium	...	...	...	...	1·17
Sulphate of lime	...	...	...	...	1·13
Chloride of magnesium	...	...	...	...	0·38
Carbonate of magnesia	...	...	...	...	0·41
Phosphates	...	...	...	...	0·19
Soluble silica	...	...	...	...	0·21
Organic matter	...	...	...	...	0·47
Total matter dissolved in imperial gallon					9·56

Hardness $7\frac{1}{2}^{\circ}$

		Cubic inches.
Total gases dissolved in imperial gallon	...	12·68

* About $\frac{1}{3}$ grain in 20 ounces.

Percentage composition of the gases—

Cubic Inches.

Carbonic acid	...	...	...	...	31.98
Oxygen	...	...	...	...	20.34
Nitrogen	...	...	...	...	47.68
					100.00

The above water is of pure and wholesome quality, and partakes of the characters of a mild chalybeate spring. It is thoroughly aërated, containing $12\frac{2}{3}$ cubic inches of gases, dissolved in the imperial gallon, of which carbonic acid constitutes nearly one-third of the whole. I am of opinion that this water will be found beneficial as a beverage, in all cases where a mild chalybeate spring is recommended.

STEVENSON MACADAM, Ph.D.,

F.R.S.E., F.C.S.,

Lecturer in Chemistry.

ANALYSES BY DR. HOFFMANN

OF THE

STRONGEST SULPHUR-WATERS OF HARROGATE.

They contain sixteen ounces :—*

I. SOLIDS.			Old	Montpellier
			Sulphur Well.	Strong
			Grains.	Grains.
Sulphuret of sodium	...	...	1'548	1'441
Sulphate of lime	...	...	0'013	0'059
Carbonate of lime...	...	...	1'237	2'418
Fluoride of calcium	...	...	trace.	trace.
Chloride of calcium	...	...	8'174	6'191
Chloride of magnesium	...	...	5'569	5'467
Chloride of potassium	...	...	6'470	0'575
Chloride of sodium	...	...	86'018	80'309
Bromide of sodium	...	...	trace.	0
Iodide of sodium	...	...	trace.	0
Ammonia	...	...	trace.	trace.
Carbonate of protoxide of iron	...	...	trace.	0
Carbonate of protoxide of manganese	...	...	trace.	0
Silica	...	...	0'025	0'184
Organic matter	...	...	0	trace.
			<hr/>	<hr/>
			109'658	96'646

* Tenth part of an imperial gallon.

2. GASES.				C. Inch.	C. Inch.
Carbonic acid	...	...	...	2'200	1'401
Carburetted hydrogen	...	...	...	0'584	0'053
Sulphuretted hydrogen	...	...	...	0'531	0
Oxygen	...	...	...	0	0'048
Nitrogen	...	...	...	0'291	0'482
				<hr/>	<hr/>
				3'409	1'984

ANALYSIS BY DR. MACADAM

OF THE

MOFFAT SULPHUR WATER.

It contains in the imperial gallon :—

	Cubic inch.
Free sulphuretted hydrogen gas	353
	Cubic inches.
Free and combined sulphur, equal in sulphur- etted hydrogen gas to	2'168
	Grains.
Sulphuret of sodium	1'51
Chloride of sodium	60'72
Chloride of magnesium	7'25
Chloride of calcium	10'02
Silicate of soda	3'46
Carbonate of lime	1'31
Carbonate of magnesia	'87
Organic matter	2'27
Deficiency in analysis of soluble salts, referable principally to moisture from the hygro- metric character of the residue obtained on evaporation of the water	1'37
Loss during analysis of the earthy carbonates	'08—1'45
Free silicic acid	traces.
Total solid residue	88'86

ANALYSES BY BARON LIEBIG
OF THE
AIX-LA-CHAPELLE WATERS.

In sixteen ounces :—*

I. SOLIDS.	Kaiser- quelle. 131°. Grains.	Cornelius- quelle. 113°6'. Grains.
Chloride of sodium	20'271	18'934
Bromide of sodium	0'028	0'028
Iodide of sodium	0'004	0'004
Sulphuret of sodium	0'073	0'042
Carbonate of soda	4'995	3'817
Sulphate of soda	2'171	2'201
Sulphate of potash	1'186	1'204
Carbonate of lime	1'217	1'012
Carbonate of magnesia... ..	0'395	0'192
Carbonate of strontia	0'002	0'002
Carbonate of lithia	0'002	0'002
Carbonate of protoxide of iron	0'073	0'046
Silica	0'508	0'459
Organic matter	0'577	0'713
	31'502	28'654

II. GASES which are contained in the same springs.

	Per cent.	Per cent.
Nitrogen	9'	7'79
Carbonic acid	89'40	92'91
Carburetted hydrogen	0'37	traces.
Oxygen	1'23	traces.

* Tenth part of an imperial gallon.

ANALYSES BY BARON LIEBIG

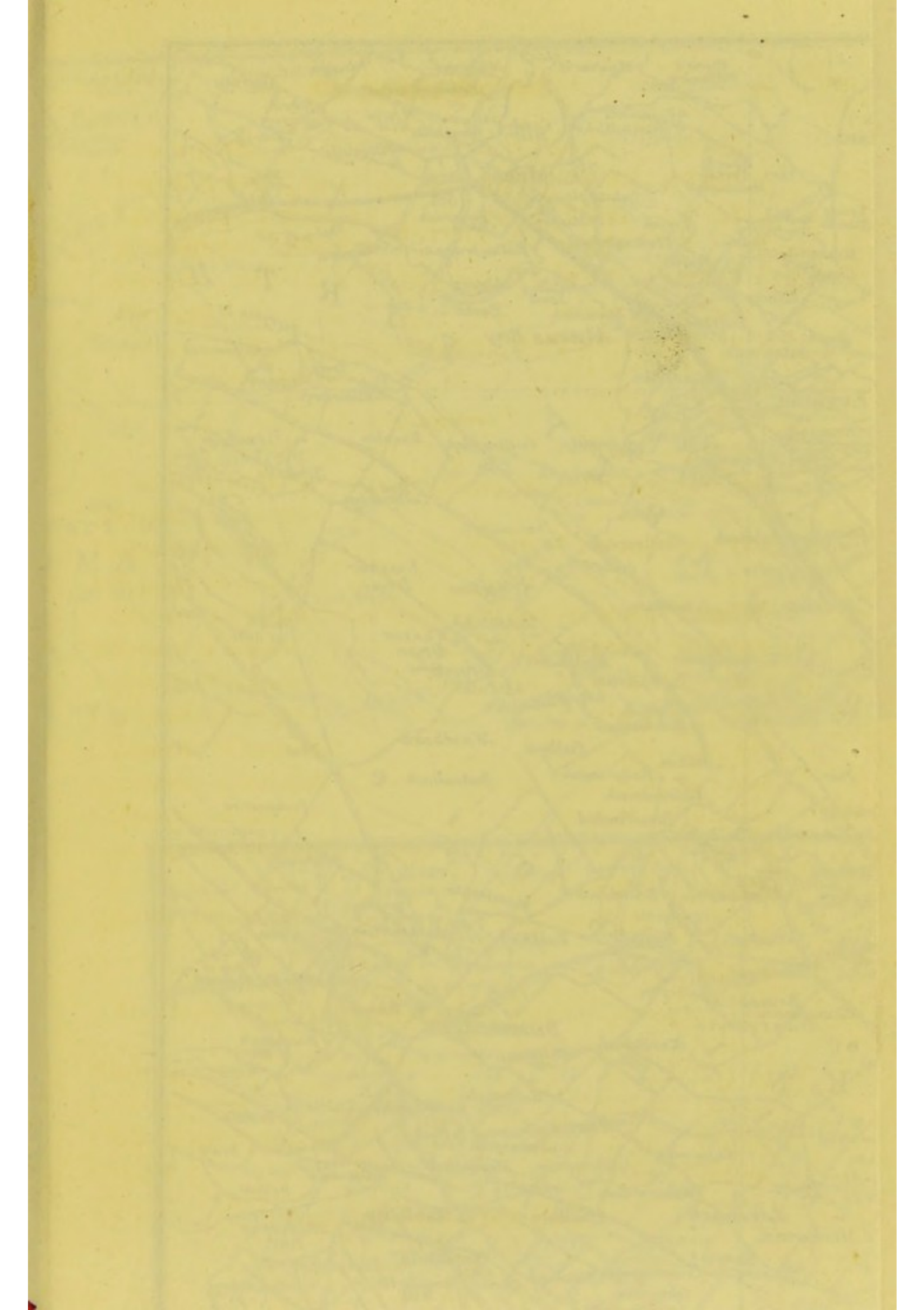
WATERS OF THE MOUNTAINS
AIX-LES-BAIENS

Grains per Gallon	Grains per Gallon		
18.034	20.771	...	Chloride of sodium
0.028	0.028	...	Bromide of sodium
0.004	0.004	...	Iodide of sodium
0.012	0.012	...	Sulphate of sodium
3.817	4.292	...	Carbonate of soda
2.201	2.171	...	Sulphate of soda
1.204	1.180	...	Sulphate of potash
1.012	1.217	...	Carbonate of lime
0.192	0.222	...	Carbonate of magnesia
0.002	0.002	...	Carbonate of strontia
0.002	0.002	...	Carbonate of lithia
0.046	0.012	...	Carbonate of protoxide of iron
0.420	0.208	...	Silica
0.712	0.217	...	Organic matter
28.624	31.202		

II. Gases which are contained in the same springs.

Grains per Gallon	Grains per Gallon	
7.79	9.7	Nitrogen
2.201	8.10	Carbonic acid
traces	0.37	Uncombined hydrogen
traces	1.22	Oxygen

* Tenth part of an imperial gallon.





ENVIRONS OF STRATHPEFFER

English Miles 0 1 2 3 4
Meters 0 1000 2000 3000 4000

J. Bartholomew & Co. Ltd.

PART II.

WALKS AND DRIVES, &c.

THERE are various places of interest and resort in the neighbourhood of the Wells, which, throughout the season, attract daily excursion parties. Some of these are within walking distance, while to the more remote, delightful drives by road and rail through the varied scenery may be had.

In the immediate vicinity of the Spa, and on the way to it from Dingwall, is Castle Leod, clad in ivy, one of the seats of the family of Cromartie. It is said to have been built by Sir Roderick Mackenzie, tutor of Kintail, in the beginning of the seventeenth century. Over one of the uppermost windows at the back of the castle, "M. M. C. 1616" may be deciphered, and over another "R. M. K. 3 Agus." "Placed near the base of a round-topped ward-hill (Knockaulah, now prettily planted), and surrounded with avenues and clumps of tall 'ancestral trees,' the castle presents as truly venerable and baronial an appearance as any residence in the Highlands." It is now occupied by Viscount Tarbat, second son of the Duchess of Sutherland. The park contains many fine old trees, and among others a Spanish chestnut, said to be the finest of its kind in Britain. It measures twenty-six feet in circumference at the base, and nineteen feet breast-high. In the Messrs. Anderson's "Guide to the Highlands," this tree, by some mistake, is

represented as having been lately thrown down by the wind. It has certainly been severely handled, but it still stands, firm as ever, its sturdy old trunk bidding defiance to the hurricane. Visitors at the Spa, by the kind permission of Lord Tarbat, have the privilege of walking in the park in the morning before ten o'clock. Between the park and the Spa, on the north side of the road, stands a stone in a mound of earth, having an eagle (the crest of the Munroes) with a horse-shoe-like delineation above, cut upon it, and called in Gaelic, *Clach-an-tionndadh*, or the Turning Stone. "It is supposed to mark the place where a number of the Munroes of Fowlis fell in an affray with the Mackenzies of Seaforth. The tradition is as follows:—Seaforth's Lady, in those days, dwelt in a wicker or wattled house at Kinellan"—a mile west from the Wells. "A party of the Munroes came upon her by surprise, and carried off the lady, house, and all that it contained. They were overtaken at this point, defeated with great slaughter, and the Lady of Seaforth rescued. *Clach-an-tionndadh* was set up by the Munroes over the remains of their fellow-clansmen." Kenneth Ore, a Ross-shire prophet of the seventeenth century,* prophesied that in course of time ships would be seen moored to this stone. The Rev. Dr. Longmuir, of Aberdeen, who has bestowed attention on the Standing Stones of Scotland, is of opinion that this one refers back to a much earlier period in the history of the country than the times of the clan feuds. The delineation surmounting the eagle he considers symbolic of heaven, the eagle denoting power. Of two standing stones at each end of the church of Fodderty there is no reliable tradition.

* Regarding this individual, and some of his other "predictions," see Hugh Miller's "Scenes and Legends of the North of Scotland," p. 163. A few of his "prophecies" have come to pass, but proof is wanting that he ever conceived them.

A favourite walk with visitors is the one to the Raven's or Echoing Rock, about a mile-and-a-half westward from the little village of Auchterneed, along the railway line. The rock presents a bold perpendicular front of imposing height, and throws back over an intervening chasm, through which the railway runs, a remarkably distinct echo. To the left of the railway line, as it nears the rock, is the chalybeate spring, called Saint's Well, from which the chalybeate water of the Spa is obtained, being conveyed to the Pump-room in iron pipes coated with Smith's patent composition. Another apparently equally strong chalybeate was discovered, during the cutting of the railway, half-a-mile nearer the village just mentioned.

Two miles east of the Spa, and on the south side of the valley, is the hill of Knockfarrel, crowned with one of those vitrified forts peculiar to the Highlands, and which are still a puzzle to the antiquary. The hill presents a very striking appearance, resembling somewhat a flattened cone. It is well-nigh perpendicular on its north and south sides. The fort is one of the most celebrated and best marked of the kind in the country. It is of an oval form, and provided with out-works at each end, which run along the shoulders of the hill-top, as if intended to interrupt attacks from enemies, where by nature these would have been most easy. The cementing material used in the consolidation of the fort may have been formed by some such process as kelp, perhaps by the mixing of wood with seaweed. It resembles not a little the slag of an iron furnace, which consists of a fused mass of clay and lime. From appearances underneath the blocks of vitrification, it is evident that the fused matter must have been allowed to penetrate from above the rampart of loose stones, some of which present the appearance of having been subjected to intense heat. "The hills on which vitrified

sites occur are usually, though not always, very conspicuous, and, with few exceptions, command an extensive view, while the summits are generally tabular or conical, and detached from other heights. They are steep and rocky, and towards the top, or at least along the most accessible approach, are wholly or partially encircled with one, two, and in some instances, with three ramparts or walls of loose stones, three or four feet in height." "The theory most reconcilable with the appearances is, that these sites were places at once of defence and for beacon-fires." From the top of the hill an extensive view is obtained, embracing, on the east, the Cromarty Firth (the seaman's safe retreat in storm—the *portus salutis* of the Romans) and Sutors of Cromarty; on the south, Loch Ousie, studded with a number of wooded islets, and in which lies Kenneth Ore's magic stone,* by which he foretold the future; on the west, the western hills of Ross, among which the conical peaks of Scurvullin present a very striking appearance; on the north, the broad and massive Wyvis, king of the Ross-shire mountains, with the populous valley of Strathpeffer intervening. Towards the west end of the valley is Castle Leod, already noticed; at the eastern extremity the woods of Tulloch (D. Davidson, Esq.) rise to view.

Continuous with the western shoulder of Knockfarrel, and forming the southern boundary of the valley of Strathpeffer, is a wooded ridge of hill, called The Cat's Back, and sometimes The Hill of Park (*Knoc-an-Parc*), from the heath-brown summit of the western extremity of which a magnificent view of the western hills is obtained. An airy walk with fine views of Castle Leod on the one side, and Loch Ousie on the other, may be had along the top of the ridge

* See Hugh Miller's "Scenes and Legends of the North of Scotland," page 165.

from Knockfarrel to this point. Between it and the conical peaks just referred to, is Loch Achilty; to the right, and about a mile and a half from the spectator, is Loch Kinellan; beyond it, a peep of Loch Garve is obtained; to the left, the two rivers, the Blackwater, and, beyond it, the Conon, are seen winding to their confluence. Looking south, the Beaully Firth comes into view; behind, on the Cromarty Firth, Invergordon can be seen. The whole scene is one of great splendour, and is best enjoyed when the shadows of the crowded hills are brought out by an afternoon sun. Easy access can be had to each of the above view-points, either by roads and footpaths through the intervening fields, or by way of Elswick Cottage (H. M. Matheson, Esq.), and along the northern margin of what is called the Blackmoor wood.

Another excellent view-point is the "View Rock," about two miles westward from the Spa. Passing either Kinellan Lodge (a mile to the west of the Spa), or Kinellan farmhouse, and skirting Loch Kinellan on its southern margin, a row of thatched dwelling-houses is seen on the opposite hillside, beyond which, a footpath turning to the left conducts to the point in question. Once reached, a charming view from it is obtained. Here again the western hills form the most prominent feature of the landscape. In the foreground is Loch Achilty, embosomed in birch-clad hills which slope to the water's edge; near it, and to the right, is Craigdarroch shooting-lodge, at the base of a wooded crag of that name. In the immediate foreground are Achilty Inn, with its farm, and the Blackwater, celebrated as a salmon stream. On an island to the left, encircled by the waters of this river, stand Contin Manse and Church. Some two miles beyond the island is Fairburn House (John Stirling, Esq.), to the left of which the old tower of Fairburn may be seen. On the left

of the spectator, are the finely-wooded grounds and mansion-house of Coul (Sir Arthur G. Ramsay Mackenzie, Bart.); on the right, Ben-Wyvis, and to the west of it, Little Wyvis. The beautifully-wooded hill of Tor-Achilty rises immediately behind the plain of the Blackwater.

About two miles to the north-west of the View Rock, are the Falls of Rogie, on the Blackwater, which are quite within walking-distance by this way from the Spa, though, through the moor, they are not always easily found. In Loch Kinellan, passed on the way to the View Rock, "stands an artificial island, resting on logs of oak, on which the family of Seaforth had at one period a house of strength; and a quarter of a mile eastward (where the Spa Hotel now stands) is the place of *Blar-nan-Ceann*, or Field of Heads, so named from having been the scene of a very sanguinary conflict, about the year 1478, between the Mackenzies of Seaforth and the Macdonells of Glengarry. The latter, according to tradition, came, as was the fashion in those days, to resent an old feud by force of arms, but were routed after great slaughter, and being pursued by the Mackenzies to the confluence of the rivers Blackwater and Conon at Moy, were there either killed or forced into the water and drowned." One thousand of the Islesmen lost their lives. This victory utterly crushed the Macdonells, and completely established the power of the Mackenzies. Kenneth the conquering hero of the battle was knighted by James IV.

A pleasant walk may be had to Contin and Achilty, by a pathway through Coul wood. The wood is reached by a footpath through the fields on the south-west side of Loch Kinellan. A very extensive and exceedingly fine view may be had from the top of Tor-Achilty just noticed. The hill is best reached by a road through Achilty farm, leaving the

main road a little to the east of Achilty Inn. The view from the top of the hill embraces, for the most part, scenery already noticed. An exceedingly picturesque view is obtained of the valley of the Conon, with Scatwell shooting-lodge to the west on its right bank. The hill "is an excellent botanical habitat" and a good one for the entomologist.

Nearer the Spa, however, many beautiful views of the valley of Strathpeffer, Ben-Wyvis, the Western Hills, and the Cromarty Firth, may be had, from Kinettas Hill, just above the Spa, and from the hill above Castle Leod, the former of which, owing to its close proximity to the Wells, is much resorted to.

But of the many views to be had from eminences around Strathpeffer, that from the top of Ben-Wyvis ("the Mountain of Storms," though it is by no means so "stormy" as its name would imply), is of course the grandest and most extensive. The hill is the property of her Grace the Duchess of Sutherland, Countess of Cromartie, and is said to be retained on condition of the holder being able to present to the Crown, from its corries, a snowball on any day of the year. It rises to a height of 3422 feet above the level of the sea, and is of comparatively easy ascent, though an excursion to its summit is somewhat fatiguing, owing to the broken and mossy nature of the ground at its base. The best way to the hill is, by the village of Auchterneed, as on the way to the Raven's Rock, keeping upwards above the village by a rugged cart-track, and crossing the western shoulder of the hill behind the village by a road leading to peat-moss at the base of the mountain; crossing then the Skiach burn, and ascending along the course of a mountain torrent coming down the hill. During the ascent the white mountain hare (a kind of half hare half rabbit), will be frequently started. On the heights ptarmigan abound. The

top of the hill affords a magnificent and bracing promenade, being an elongated winding flat or plateau of some two miles, carpeted with a firm elastic turf, quite refreshing to walk upon after the fatigue of climbing. The view from the top, on a clear day, embraces all between the mountains of Caithness and Sutherland in the far north, and the Grampians in the distant south—some eight counties, with the island of Lewis, if the atmosphere is very clear—a sight most gladdening and restorative. At least a score of Scotland's lakes lie sparkling in the view. The western hills of Ross, standing up like some mighty army, stretch away to the west, while to the east the quiet waters of the Moray Firth, expanding outwards into the German Ocean, contrast strikingly with the romantic grandeur of the landscape. The distance from the Spa to the top of the hill is about ten miles. Ponies may be taken all the way to the top. The ascent can be accomplished between breakfast and dinner. If required, a guide may be obtained in the person of "Geordie" Munro of Park, who knows well every turn, and is not without something to say. Another guide is Simon M'Kay, of the village of Auchterneed, who was recently employed *to cart* wire-fencing, &c., to the top. The barometer should be consulted before setting out for the hill, and a good field-glass would of course be useful.

A mile from the summit, and within a hundred yards of the way of ascent, is a huge spring of the purest and coolest of cold water, issuing from the side of the mountain, and yielding some 4000 or 5000 gallons an hour.* The guide would point it out. A hotel on the summit of this "Mountain of Storms" would certainly be a "castle in the air," but

* At this rate it would supply a population of 4000 with from 24 to 30 gallons a day each. The average supply in *English towns* is 28 gallons per head.

meanwhile it would have the material advantages of adamantine foundations, and a "grand parade" in the truest sense of the term, commanding a panoramic view, for grandeur and beauty, among the finest in the world. The eye would be feasted, delicate chests would be healthfully expanded, and there would be an enjoyable certainty of unusual security from "germs" and sewer gas. This "castle" would almost rival Mürren and the Rigi-Kaltbad—well-known Alpine health resorts.

The various lochs in the neighbourhood of Strathpeffer offer great facilities for "boating," but they have not yet been taken advantage of for this purpose for Spa visitors. Fishing may be obtained, but salmon fishings are in general let for the season. Parties staying at Strathpeffer frequently take a run by train (between breakfast and dinner) to fish on Loch Auchnanault, and sometimes permission can be obtained to fish on Loch Luichart and the streams flowing into it; also on Loch Garve.

Towards the end of the season a little "nutting" may be enjoyed in some hazel copses near the Spa. These lie northwards from the Spa, through the fields.

If, however, there is abundant scope for *walking* in the immediate vicinity of the Wells, there are also many attractive *drives* in the country around.

Of drives, that to the Falls of Rogie is a very favourite one. The Rogie Falls are five miles west of the Spa, on the Dingwall and Skye road, and may be seen from the road, at a point little more than a mile beyond Achilty Inn. They are on the estate of Coul (Sir Arthur G. Ramsay Mackenzie, Bart.). A more picturesque piece of scenery than they, with their birch-clad surroundings, constitute, is seldom to be seen. From an airy foot-bridge suspended just below the Falls an excellent view of them is obtained. If the sun

shines, and its position is favourable, a small rainbow may be seen in the floating spray; and in the season, the salmon may with interest be watched at their saltatory efforts "taking," or attempting to "take," the Falls. The drive to the Falls may be pleasantly prolonged four miles further, through wild mountain scenery, by Loch Garve, to Garve Inn, a comfortable house, with a number of stags' heads and Highland ornaments to be seen in it. As the railway here is very close to, and parallel with the road, the times of the passing of trains had better be studied with timid horses. Strathgarve Lodge, the Highland residence of Charles A. Hanbury, Esq., is seen a mile to the right, at the upper end of Loch Garve. Five miles beyond Garve Inn, by the Auchnasheen road, and beautifully situated amid birken copse at the western extremity of Loch Luichart, is Loch Luichart shooting-lodge, on the property of Lady Ashburton. Garve is the first, and Loch Luichart the second station on the Dingwall and Skye line after leaving Strathpeffer.

The genuine "peat-reek" perfume is generally discernible in the air about Garve. Further west, by land and sea, this perfume is to be met with in a concentrated form as an "essence"; how obtained, however, we cannot quite recollect, though probably from the rafters or thatch of damp peat-smoked huts. Abroad, we have met ladies, natives of those regions, who carried with them the delicate perfume in their scent bottles, as a cherished souvenir of their native glens. "The Real Peat Reek" is a name at times humorously applied to real (original) Scotch whisky—owing to the smoky flavour it acquires from *peat* used in drying the malt. We believe that such distilleries as those of Islay, Campbeltown, Skye, Glenlivet, Long John, and others, owe their celebrity to this *peat flavour*, which recommends the spirit not only to Scotch, but nowadays to many English palates. Southern

distillers might find the "essence" of some value in *their* manufacture of whisky.

Another favourite drive is that to the Falls of the Conon, which are nine miles from the Spa. They and the Rogie Falls are sometimes both "done" at once, the latter being only a mile off the road, in going to, or returning from the former. The road to the Conon, striking to the left, leaves the Dingwall and Skye road a little beyond Achilty Inn. Passing Craigdarroch shooting-lodge and grounds on the right, and skirting the exquisitely beautiful Loch Achilty, it proceeds through most picturesque scenery, over birch-clad knolls to the valley of the Conon. About half-a-mile beyond the western extremity of Loch Achilty, and a short way off the road, is the small Loch Giglio, the margins of which, in the season, are richly bedecked with water lilies. On nearing the Conon, Scatwell Lodge (Alexander Mackenzie, Esq.), comes into view. A mile to the left, and to the west of it, the river Meig, from Strathconon, will be seen joining the Conon. Shortly afterwards the carriage road comes to a stop, and the rest of the distance to the Falls (about a mile) must be walked. A ragged footpath, running parallel with the stream, through birch and bracken, conducts to the Falls. What are called "The Falls" (Lower and Upper) are the two principal of a series of cascades, occurring in the first mile of the course of the Conon, after issuing from Loch Luichart, its parent lake. The Loch is about a quarter-of-a-mile above the Falls. The Lower Fall partakes more of the nature of a running cataract, while at the Upper, the water falls more precipitously, and from a greater height. Owing to the greater volume of water in the Conon than in the Blackwater, the Upper Fall, if seen near, is more imposing than are the Rogie Falls, while the scenery around is wilder. The

Conon here separates the estate of Coul from the Loch Luichart property of Lady Ashburton. The lofty crag beyond the Falls is called Scur-Marxy. Returning from the Falls, the stream may be crossed by a ferry-boat, stationed at the point where the carriage road stops, and the deep gorge, a mile southwards, through which the Meig pours its waters from Strathconon, examined. The rocky sides of this gorge rise to a height of from 200 to 300 feet. Just below the junction of the Meig and Conon the stream may, if the water is low, be forded by carriages, and (time permitting), the drive pleasantly prolonged round the hill of Tor-Achilty eastward, through charming scenery overhanging the Conon—returning home by re-crossing the Conon by Moy Bridge. The road on the other side of the water is that through Strathconon. It runs westwards through the strath about fourteen miles, and passes Scurvullin Hill on the right, some eight miles above Scatwell. The mountain scenery of this valley is very fine. The river Conon is celebrated for the number and quality of its pearls.

The Falls of the Orrin are about six miles south-west of the Spa, with good carriage road (nine miles) all the way. Leaving the Dingwall and Skye road at Contin village, and crossing the Conon a mile and a half eastward at Moy Bridge, the road runs almost straight over a cultivated and wooded tract of the property of John Stirling, Esq., of Fairburn, to the Orrin water. On nearing the stream, a carriage drive will be seen on the right, leading to the Falls. The district around, through which the river flows, is richly wooded and romantic in the extreme. At the Falls, the water rushes over a mass of conglomerate rock. Becoming confined in a narrow sloping channel, it hurries furiously onwards to a precipice of some height, over which it pours into a deep elongated chasm, and reaches the level of the

stream below. Here, too, the salmon may, in the season, be watched "taking" the fall. North of the Falls, little more than a quarter of a mile, and reached by a footpath through the wood on the bank, is Fairburn Tower, tall and lone and roofless, anciently a stronghold of the freebooter, now a "ghastly spectre of the past, looking from out its solitude on the changes of the present." Northwards from the Tower, about three quarters of a mile, are one or two sulphur springs, the same in kind as those of Strathpeffer, and north-west from them are two others, the one on the side of the bed of the Conon, the other below Fairburn Mains. The strongest of these, according to our analyses, contained scarcely an eighth of the sulphuretted hydrogen found in the Strathpeffer Strong Well. The two last-mentioned are on the estate of Fairburn (J. Stirling, Esq.) In returning from the Falls of the Orrin, a fine view is obtained of the grounds of Brahan Castle, the seat of J. A. F. H. Stewart-Mackenzie, Esq., of Seaforth.

A very pleasant drive of thirteen or fourteen miles may be had by the woods of Brahan, and the village of Maryburgh, to Dingwall*—returning home by the valley of Strathpeffer. On approaching the grounds of Brahan, the bold perpendicular cliffs called "The Brahan Rocks," wooded on the top, and towering high over the woods below, present a very imposing spectacle, the road meanwhile leading through enormous fragments of rock, mossy and tufted with fern, which at some remote period must have fallen with thundering crash from the precipices above. Here the road divides into two—the one to Maryburgh and Dingwall striking to the left, the other holding on through the grounds of Brahan.

* The native town of the mother of Mr. Gladstone, and in which the Premier recently purchased property, originally erected by her for the benefit of the poor.

At the point of division, is a monument erected over the spot where a sister of the late Hon. Mrs. Stewart-Mackenzie sustained injuries in a carriage accident, the immediate consequences of which were fatal. Respectable visiting parties are always made welcome to see the grounds and gardens of Brahan.. The policies are extensive and splendidly wooded, the gardens exceedingly fine, the flower garden being laid out with exquisite taste. The Castle is a massive modernised building, originally castellated. It contains many choice works of art; among others, a large family-piece by West, which is said to have cost £3000.

The Falls of Kilmorack, two miles from Beauly, may either be driven to all the way, or train may be taken to Beauly (Dingwall to Beauly, eight and a half miles). The drive is by Moy Bridge (mentioned in the drive to the Falls of Orrin), the small village of Marybank (turning here to the left), the Established and Free Churches of Urray, the village of Tarradale, the Muir of Ord market-stand, and Beauly. From the road, after passing Marybank, fine views are obtained, on the left, of Brahan Castle and its surroundings. On the plain of the Muir of Ord are two upright stone pillars commemorative of some feat of ancient warfare. The Falls lie west from Beauly, and are reached by way of Beauly Bridge, the road at the north end of the bridge leading westward along the north bank of the Beauly river, in the course of which stream the Falls occur. They are situated immediately underneath the parish Church of Kilmorack, and "are less remarkable for their height than their breadth and quantity of water, and for the beautiful accompaniments of lofty rocks, smooth green banks, and hanging woods which encircle them. The river, dashing from between two lofty precipices, where it is confined to an extremely narrow channel, suddenly expands into an open

semicircular basin, through which it slowly glides, and is then precipitated over its lower edge in a series of small cataracts." Below the Falls, on the right bank of the stream, Beaufort Castle, the seat of Lord Lovat, is beheld to great advantage. Fine views may be had from the clergyman's garden, and from a bridge across the river 200 or 300 yards below the Falls. Another "group of waterfalls occurs about three miles up the river, at the top of a most romantic ride called 'The Drhuim,' which signifies a narrow pass. This is the most sweetly Highland and beautiful part of the course of the Beaully. On either hand the mountain acclivities are rather steep and rocky, and the valley between them is not a quarter of a mile broad; but woods of birch and fir encompass the whole scene, especially on the north side, and the edges of the river are fringed all along with rows of oak, weeping birches, and alders. In one part, half up the strath, near the cottage of Teanassie (the burn of which will reward its being explored), the waters plunge through a rocky passage encircling high pyramids of stone, standing up in the midst of the stream, gigantic witnesses of its ceaseless and consuming power." "On the southern shore, on a high conical mound, rising above a perpendicular sheet of rock, is Dun Fion, a vitrified structure, laid open some years ago for the inspection of the curious by order of Lord Lovat." "At the further end of the Drhuim, the road begins to ascend towards the interior of the country, and here the river is seen pouring down on each side of a high rounded hill, covered with oak and birch, at the lower extremity of which it forms the second set of small but beautiful cataracts." This is the Island of Aigas (for the river parts into two, and encircles it), with a picturesque shooting-lodge, which was the summer retreat of the late Sir Robert Peel, during the last year of that great statesman's life. An open glen succeeds, with the

house of Aigas (— Chisholm-Batten, Esq.) on the right; on the left, the elegant mansion of Eskadale (a shooting-lodge of Lord Lovat's); "to the westward, the small hamlet of Wester Eskadale, behind which, though half-concealed by the birch trees, appear the white walls and pinnacles of a handsome Roman Catholic Chapel built by Lord Lovat." Four miles on, is Erchless Castle, a stately old tower modernised, the seat of "The Chisholm." At Eskadale there is a ferry across the river, of which the pedestrian visitor to the Falls, and the Drhuim, might avail himself to vary the homeward route to Beauly—returning by a road which runs along the south side of the river through the parish of Kiltarlity. About a mile beyond Erchless are Struy Bridge and Inn. The drive from Beauly to Struy Bridge, up the one side of the stream and down the other, might be easily managed between an up train in the morning and a down train in the afternoon. More picturesque scenery than that along the course of the Beauly is rarely to be met with in the Highlands. The Kiltarlity road runs between the extensive and wooded grounds of Beaufort Castle (noticed above), and those of Belladrum (the late James Merry, Esq., M.P.), "one of the most elegant and costly mansions and demesnes in the Highlands." Time permitting, the ruins of the ancient Cistercian Priory of Beauly, founded A.D. 1230, by John Bisset, of Lovat, might be inspected. "It is now a mere shell; the roof is fallen, and the area within is occupied only with the rubbish of the walls, and the closely-set graves of the clan Fraser and their allies." "The remains of its orchard attest the fertility of the ground, and the attention which the old French monks paid to horticulture." For descriptions in full of the Priory and scenery of the Beauly, see Messrs. Anderson's "Guide to the Highlands," from which we quote. On the course of the Glass (the continua-

tion upwards of the Beauly), and between Fasnakyle Bridge (ten miles above Struy) and Loch Benneveian (five miles further on) is "The Chisholm's Pass," "the scenery of which is somewhat similar to the celebrated birken bowers of Killiecrankie and the Trossachs, but on a much ampler and grander scale." "In ascending the shelving opening" (by the road on the north side of the stream), "a prolonged vista, in one general mantle of foliage, rising high on either side, forms a woodland picture of incomparable beauty, threaded by the rocky channel of the river." The road, on the south side of the stream, from Fasnakyle Bridge to Guisachan, the exceedingly picturesque Highland residence of Sir Dudley Coutts Majoribanks, M.P., runs within a mile of the pass on the right.

A very extraordinary and interesting natural curiosity, and one well worthy of a visit, is what is called "The Black Rock," a frightful chasm, occurring in a thick level bed of conglomerate near Evantown on the Cromarty Firth. It is twelve miles from the Spa, and may either be driven to all the way, or train may be taken to Evantown—coming out at the Novar Station. If a carriage is taken, the drive along the margin of the Cromarty Firth will be much enjoyed. Between Dingwall and Evantown, the road and line of railway skirt in succession the estates of Tulloch (D. Davidson, Esq.), Mountgerald (Captain James Dixon Mackenzie), and Fowlis (Charles Munro, Esq.). A branch road, striking off northwards from the main road, just beyond Evantown, brings us in a mile, near to the chasm. It is then reached by crossing, from a little saw-mill on the roadside, the corner of a field on the left. Only two or three yards wide, and in many places arched over by intermingling branches of trees from the opposite sides, it is 130 or 140 feet deep, and fully a mile and a half in length.

At its bottom, the waters of the Aultgraad or *terrific burn* (crossed on leaving Evantown), visible only here and there from the bank above, rush and growl and tumble and rumble in hideous subterranean gloom, fit haunt for goblins. A footpath along the wooded bank conducts, a mile and a quarter upwards, to a wooden bridge over the chasm, from which (if the beholder will venture) an open view of its profundity may be obtained. The Aultgraad issues from Loch Glass, about three miles above the chasm, and forms, after quitting the loch, a series of highly picturesque falls. Loch Glass lies at the base of Ben-Wyvis. The chasm is, no doubt, the result of the action of the water on the rock, mostly perhaps at a time when the conglomerate was in a less compact state than now.*

Ardross Castle, the princely residence of Alexander Matheson, Esq., M.P., is eighteen miles from the Spa. It will well repay a visit, and the drive to it is a most enjoyable one. The Castle is five miles from Alness, the next village eastward, by road and railway, from Evantown just referred to. On quitting Evantown, we enter on the magnificent estate of Novar (— Ferguson, Esq., of Raith and Novar). The fine mountain of Fyrish, beautifully wooded, and topped by a clump of perpendicular stones, arranged as an Indian temple, attracts special attention. A peep of Novar House down the approach is obtained from the road in passing. Two miles beyond Evantown, a road, striking off from the main road, at the old toll-house, into the interior of the country, conducts to the demesnes of Ardross. If train be taken to Alness Station, another road will be found leading up from the village to the grounds. Respectable visitors are

* Of course, such places as this and the Old Knockfarrel Fort have in "the North," their "legends." See Hugh Miller's "Scenes and Legends of the North of Scotland," pages 38 and 171.

always made welcome to see the grounds, garden, and public rooms of the Castle.

At Invergordon, three miles beyond Alness, there is a ferry to the Cromarty side of the firth. This is a pleasant and convenient route for visiting the native place of Hugh Miller. A conveyance, running between the landing-point and Cromarty, in connection with trains passing Invergordon, leaves the ferry (at present) at 10 A.M. and 6 P.M. The distance to Cromarty from the ferry is eight miles. At Balblair Inn, on the opposite shore, carriages are let out on hire.

With railway extension now into Sutherlandshire, Dunrobin Castle, the magnificent residence of His Grace the Duke of Sutherland, near Golspie, is within easy access from Strathpeffer (from Dingwall to Golspie, some three hours). The scenery of the Sutherland part of the journey will be much enjoyed. Their Royal Highnesses the Prince and Princess of Wales are now frequently the guests of the Duke and Duchess of Sutherland at Dunrobin. The Castle was founded by Robert, second Earl of Sutherland, A.D. 1097, and by recent additions has become "one of the most princely palaces in the kingdom, and undoubtedly one of the largest in Scotland." "The private rooms are arranged into numerous suites of apartments, each appropriated to some member of the family, and named accordingly, as the Argyll, the Blantyre, and other apartments, and each is distinguished by its own peculiar style, coloured decorations, and paintings. The state-rooms specially prepared for her Majesty, command the grand sea-ward view, comprehending almost the entire circuit of the Moray Firth." They are, of course, furnished in the most sumptuous manner, as are also the other public and principal private rooms. Admission is liberally granted

to the castle and grounds. "The late Mr. Barry's genius appears to great advantage in the style of the building, and the good taste of the late Sir Joseph Paxton is seen in the gardens."

The late Mr. Frank Buckland, in his "Log Book of a Fisherman and Zoologist, remarks, "a museum situated in the pleasure-grounds near the Castle, is admirably fitted up, and contains a most interesting collection. The antiquities, especially the Pictish relics, are well worthy of notice, but to the naturalist the collection of birds is of the highest interest. In the museum we find specimens of nearly all the native *avi-fauna* in Scotland."

The same interesting writer also observes, that the Duke of Sutherland is head of Clan Chattan, or the "Clan of the Cats," and mentions that his Grace was good enough to show him the silver brooch that he wears in his bonnet. It represents the head of a cat, and is mounted with two wild cats' teeth, one of which was found in an ancient Pictish tomb. "At the first Cat Show held at the Crystal Palace in July, 1871, the Duke of Sutherland exhibited a splendid wild cat, caught by Captain Houstoun of Kintradwell. This wild Scotch cat won a prize of £1 10s."

Mr. Buckland goes on to say, that, "there is perhaps no district in the Highlands where the breed of wild cats exists in greater purity or perfection than in Sutherlandshire . . . Tradition has it that once upon a time Sutherland was invaded by a hostile band, and that upon landing they were opposed by an advanced guard of furious wild cats, and so well did the latter defend the coast, that the enemy skeddaddled without coming to the scratch! . . . The breed of real wild cats is, I am sorry to say, in many districts extinct, and getting more scarce every year in this country. Civilization in general, and keepers' traps and terriers in particu-

lar, will ultimately finish the race. Nevertheless, a good remnant will be left for future lovers of natural history, as long as the fine old deer-forests are kept up. Let us hope that game preservers and keepers may deal leniently with this fine animal, now becoming so scarce, and that Sutherlandshire in particular may never want some living representatives of the crest of its noble house."

The Duke of Sutherland (Sir George Granville William Sutherland Leveson Gower), Marquess of Stafford, Earl Gower, Viscount Trentham, Baron Gower, in the peerage of England; Earl of Sutherland, and Baron of Strathnavar, in that of Scotland; and a baronet; Lord Lieutenant of Sutherlandshire; born 19th December, 1828; succeeded his father as 3rd duke, 28th February, 1861; married 27th June, 1849, Anne, only child of the late John Hay-Mackenzie, of Newhall and Cromarty, created 21st October, 1861, Countess of Cromartie, Viscountess Tarbat of Tarbat, Baroness Macleod of Castle Leod, and Baroness Castlehaven, in the peerage of the United Kingdom; in her own right, with limitation to her second surviving son Francis;—
Issue:

1. George Granville, Earl Gower, born 27th July, 1850, died 5th July, 1858.

2. Cromarty, Marquess of Stafford, born 20th July, 1851.

3. Francis, Viscount Tarbat, born 3rd August, 1852, married 2nd August, 1876, Lilian Janet, third daughter of Godfrey William, fourth Baron Macdonald.

1. Florence, married 15th December, 1876, to Henry Chaplin, Esq., of Blankney, Lincolnshire, M.P. for Mid-Lincolnshire.

2. Alexandra.

The title of Earl of Cromartie, forfeited in the person of George, third Earl, after the rebellion of 1745, has thus been

restored to a descendant of the same family, by a new creation in favour of the present Duchess of Sutherland.

William, sixteenth Earl of Sutherland, was one of the loyal Highland chiefs at the time of the rebellion, and contributed much to its suppression.

At Golspie there is superior hotel accommodation. The Kildonan gold district is accessible by railway, the station being a little over an hour from Golspie. Railway extension is now complete to Wick and Thurso.

His Grace the Duke of Sutherland is at present engaged in reclaiming moorland at Kildonan. By the side of Loch Shin, three miles from Lairg, the Duke has, during recent years, brought under cultivation several thousands of acres of moor, the improved land being thrown into holdings, varying in extent from 10 to 400 acres each, with suitable proportion of hill outrun. When the belts of plantation which are now springing up around these farms have sufficiently grown, their amenity will be much enhanced.

A very interesting excursion might be made by railway to Culloden Moor, the scene of the last battle on British soil, where Prince Charles Stuart, after having penetrated into the heart of England, and imperilled the existence of the Hanoverian dynasty, was at last defeated by the Duke of Cumberland, and the hopes of the house of Stuart finally extinguished, April 16th, 1746. Culloden Station is three and a quarter miles from Inverness, and the battle-field about three from the station. "A monumental tumulus or obelisk on the heath, abandoned after being barely commenced, marks the spot where the contest was fiercest; and the public road passes through the graves of the slain, which consist of two or three grass-covered mounds, rising slightly above the adjoining heath, at the distance of about 200 or 300 yards from some corn land and a cluster of cottages, where the English

artillery took up its position, a slight marshy hollow intervening between them and the Highland army." "The ash-tree whence Prince Charles beheld the battle still stands, the best part of a mile to the west; and the less perishable boulder-stone, from which it is said the Duke of Cumberland issued his orders, is shown on the roadside, about a quarter of a mile east from the principal heap of graves." About 1200 men are said to have perished in the battle, the number of killed on both sides being about equal. "Never was rebellion more cruelly punished. Neither on the field, nor in the flight, was quarter given. Even when they had disbanded, and fled to the shelter of their mountain homes, the rebel clans were hounded out by the king's soldiers; the whole country was wasted with fire and sword, and the women and children who escaped immediate death, were left to die by thousands, of cold and hunger on the barren heath. In the midst of this desolation, the Prince himself wandered a wretched outcast, and after many a hairbreadth escape, was taken on board a French privateer, and landed safely in Brittany. A price of £30,000 had been set on his head, but not a Highlander could be found mean enough to betray him." *

In Culloden House (Arthur Forbes, Esq.), passed on the way to the battle-field from the station, are some interesting relics of these times. The bed in which the Prince slept prior to the battle, and his walking-stick, are carefully preserved, and there are also several swords, pistols, battle-axes, &c., which have been picked up from time to time on the battle-field. The present Culloden House was built in 1780, on the site of the old castle. The scene and story of the battle of Culloden have been very interestingly described in

* See more fully "Charles-Edward," in the "Imperial Dictionary of Universal Biography."

a shilling publication, by the late Mr. Peter Anderson, of Inverness. Visitors to the battle-field would do well to provide themselves with it, in passing through Inverness. The battle is interestingly referred to by Miller in his "Scenes and Legends," page 323.

Fort George, at the entrance of the inner basin of the Moray Firth, and three and a half miles from the Fort George Station, was erected soon after the suppression of the rebellion of 1745, for the purpose of keeping the Highlanders in subjection. The fortifications cover an area of about fifteen English acres, and there is accommodation, it is said, for about 3000 men. The Fort George Station is ten miles from Inverness. An omnibus generally waits to convey passengers from the Station to the Fort.

The grandly picturesque Dingwall and Skye railway has made pleasantly accessible, from Strathpeffer, the Highlands and the Islands of the West Coast.

Some may imagine that railways interfere with sport, but, as the late Mr. Buckland remarked, "A great advance has been made in making the railway which runs due west from Dingwall, thus bringing Skye into communication with big towns. I do not think railways interfere much with red deer. . . . We have all of us seen sheep and cows staring quietly at the train as it passes at full speed through their enclosure, and why should not deer also get accustomed to the noise and rattle? I understand, however, that railway wire fencing will sometimes cut off deer from their own forests, but I have heard from Lord Lovat that the deer go along by the wires until they find out the passage of the bridges, and then get over them. Railways, therefore, do not, as far as I hear, interfere with shooting; they open up properties, they encourage commerce, they bring capital and fresh blood into Scotland."

In the journey from Dingwall to Golspie, we pass through, in succession, the countries of the Munroes, Rosses, and Sutherlands. The country of the Mackenzies extends from Cromarty to the west coast of Ross-shire, and includes Lewis. The Beaully river runs through the countries of the Frasers and Chisholms. Culloden Moor is in the country of the Mackintoshes.

A well-known writer says, "there is no county in Great Britain or Ireland that offers so many enjoyable excursions, whether far or near," as Ross-shire.

GEOLOGY.

A calcareo-bituminous rock—Fish-bed Schist of the Old Red Sandstone system—emitting when broken a peculiar fetid odour, the result, no doubt, of the decay of animal matter still going on—occurs in large quantity in the neighbourhood of the Wells. It presents generally a laminated, but sometimes also a mixed, compact appearance, the latter evidently being the result of the laminae of the former having been broken up prior to final consolidation. From this rock, the sulphur waters of the place derive their ingredients and properties. Kinettas Hill, behind the Spa, appears to be entirely composed of it. Says Hugh Miller, in his "Old Red Sandstone," "Is it not a curious reflection that the commercial greatness of Britain in the present day should be closely connected with the towering and thickly-spread forests of arboraceous ferns and gigantic reeds—vegetables of strange form and uncouth names—which flourished and decayed on its surface, age after age, during the vastly extended term of the carboniferous period, ere the mountains were yet upheaved, and when there was as yet no man to till the ground? Is it not a reflection equally curious, that the invalids of the present summer should be drinking

health, amid the recesses of Strathpeffer, from the still more ancient mineral and animal débris of the lower ocean of the Old Red Sandstone, strangely elaborated for vast but unreckoned periods in the bowels of the earth? The fact may remind us of one of the specifics of a now obsolete school of medicine which flourished in this country about two centuries ago, and which included in its *materia medica* portions of the human frame. Among these was the flesh of Egyptian mummies, impregnated with the embalming drugs—the dried muscles and sinews of human creatures, who had walked in the streets of Thebes or of Luxor three thousand years ago.”

The rocks in the immediate vicinity of the Spa belong generally to the Old Red Sandstone, a formation thrown down from deep salt seas abounding in fish rather than in vegetable matter. The animal organisms of the fish-bed schist appear to have been of an entirely destructible nature, no fossilized remains, so far as we understand, having been discovered in it. A seam of soft friable bitumen, capable of yielding a high per cent. of oil, occurs in the hill above Castle Leod, not however, according to recent investigations, in sufficient quantity to pay the working of it. A finer variety of this mineral, occurring in hard jetty-looking pieces, and highly inflammable, has been dug up near the river Skiach, at the foot of Ben-Wyvis. The ridge of hill extending from Knockfarrel to the Brahan Rocks, is entirely or mainly conglomerate—the great base of the Old Red System. Conglomerate also abounds along the northern margin of the Cromarty Firth. Primary gneiss is the prevailing rock of the hills to the north and west of the Spa. The bottom of the valley of Strathpeffer is of an alluvial character, which would partly account for its great fertility. Other inland recesses in its neighbourhood are of the same description.

BOTANY.

The less common botanical specimens met with in the district are, the *Pinguicula lusitanica* and *Melampyrum sylvaticum*, near Castle Leod ; the *Pyrola uniflora*, *Corallorhiza innata*, *Malaxis paludosa*, and *Lycopodium inundatum*, in the neighbourhood of the View Rock ; the *Linnæa borealis*, in the Brahan woods ; the *Thalictrum alpinum*, and *Circea alpina*, on Scur-Marxy ; the *Arbutus alpina*, *Saxifraga oppositifolia*, *Betula nana*, *Azalea procumbens*, *Alopecurus alpinus*, *Arctostaphylos uva ursi* and *alpina*, *Rubus chamæmorus*, *Polypodium phegopteris*, *Salix myrsinites*, *Lycopodium alpinum*, *Epilobium alpinum*, and *Saxifraga stellaris* around and upon the Wyves ; the *Epilobium angustifolium*, *Lycopodium selaginoides*, and *Saxifraga aizoides* in the neighbourhood of the Falls of Rogie. The district is a good one for the collecting of ferns. Mosses also of every shade and colour are to be met with.

PLACES OF WORSHIP.

The Established Church of Fodderty (Rev. J. Menzies) is a mile eastward from the Spa, the Free Church (Rev. W. S. Macdougall) over a mile westward, the Established Church of Contin (Rev. J. Tolmie) about three miles westward. The services are in Gaelic in the morning, and in English in the afternoon. There is an Episcopalian Chapel (Rev. W. J. Bussell) at Dingwall. Mr. Bussell has officiated during recent seasons on Sunday afternoons, in the Promenade Hall, for the convenience of members of the Church of England staying at the Spa. During the season there are Presbyterian services in English every Sunday evening, in the Lower Pump-Room, in connection with the Established

Church of Scotland, and in the Meeting-house adjoining the Upper Pump-room, in connection with the Free Church. There are also, during the season, daily religious services in the Meeting-house at 11 a.m., conducted generally by clergymen attending the Wells. The Meeting-house is the gift mainly of H. M. Matheson, Esq., of London, who has placed in it a small library, chiefly of religious books, to which there is free access.

A Lending Library, in connection with Messrs. Douglas & Henli, Edinburgh, has been commenced, and is found to be an attraction to the reading public. It is in the charge of Miss Maclean, who has also a Bazaar of useful and fancy goods.

Amateur concerts, readings, lectures, &c., enliven the evenings of "the season," the proceeds being devoted to charitable purposes.

CONCLUSION.

The reader will not have failed to perceive the many and splendid natural advantages of Strathpeffer, and the possibilities in store for it. Till within the last sixteen years nature had been doing everything for the place, man but little. It is now being energetically developed, and must in the future advance. Peat or turf baths, the virtues of which are freely admitted, and which are to be had at many German Spas, might easily be introduced; also, sand baths, perhaps by-and-by milk and whey "cures." The chalybeate water might, by special process, be preserved in bottle.

In the early part of the present century, Dr. Morrison, of Elsick, having had his own health re-established at the Spa, strongly advocated to his friends the claims of the waters.

As has been shown in the foregoing pages, the sulphur springs are far the strongest of their class in this country, while peculiarly applicable ; the climate is bracing without being cold ; the situation is sheltered and picturesque, combining cultivated country with truly Highland scenery. In short, Strathpeffer, being now easily accessible, and yearly becoming, through the merits of its Springs, more and more widely renowned, will, we venture to predict, ultimately be a Queen among British Spas, and rank high in the list of the Health-resorts of Europe.



ERRATA.

Page 19, fourth line from bottom, for "alternately" read "alternating."

Page 21, thirteenth line from bottom, for "when" read "where."

Page 30, ninth line from top, for "alternatively" read "alternately."

Page 55, thirteenth line from bottom, for "ragged" read "rugged."

Page 10, second sentence from top—Since going to press with the present edition of this work, we have learnt from Dr. Medlock's analyses that Strathpeffer as a sulphur water is pre-eminently rich in *Carbonic Acid Gas*, which renders it all the more palatable and digestible, considered along with its European compeers. It contains three or four times the quantity found in the waters with which we have compared it. The gas is generated mainly during the chemical changes which occur in the formation of the constituents of the springs.

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EXTRACTS FROM REVIEWS
OF THE
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“.....A sensibly-written *brochure* setting forth in a favourable light the virtues of this Spa, which evidently deserves to take a high rank amongst sulphurous waters, whether British or Continental.”—*“Bibliotheca Therapeutica” of New Sydenham Society.*

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“The sulphurous waters of Strathpeffer, near Dingwall, Ross-shire, are among the most celebrated and beneficial of the Scottish mineral waters. The vale of Strathpeffer itself is one of the most picturesque in a picturesque country. Almost under the shadow of the Mountain of Storms and the mighty dome of Ben-Wyvis was the old battle-ground of the Mackenzies, now against the Macdonalds, now against the Munroes. Victory generally sat on the bonnets of the former. To speak in local phrase, the 'Caberfae' carried the day. To this district Dr. Manson has written a valuable, concise guide—one not only for invalids, but for healthy tourists; for idlers, loungers, men of science, excursionists who have done the Engadine, and should now be thankful for the opportunity Dr. Manson gives them to explore this Scottish home of beauty with his book in hand. It is a sensible book, put together by a competent man of science, who, having something to say, knows how to say it, and how to leave off when he has said enough.”—*Notes and Queries.*

“.....Of the Strathpeffer springs, several are sulphurous, one very strongly so, containing nearly nine grains of sulphur per gallon, partly in the free state, and partly as sulphides of hydrogen, potassium, and sodium. There is also a chalybeate spring, said to contain about two and a half grains of ferrous carbonate per gallon.....”—*The Lancet*.

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“Dr. Manson has published a second edition, revised, of his little book on the sulphur waters of Strathpeffer, which have attained some fame among those who have faith in the curative powers of mineral springs.....”—*The Daily News*.

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“The valetudinarian class of travellers and excursionists from town, before they resolve to start for Germany or Switzerland, should once more be reminded that North Britain has its medicinal waters, as well as its refreshing airs and interesting scenery, which may do them as much good as those of the Taunis, the Black Forest, the Alps, or the Pyrenees. To Strathpeffer, in Ross-shire, twenty-five miles beyond Inverness, we would direct the attention of those who are recommended to try a fine sulphurous cold draught, for the benefit of the stomach and liver and other digestive organs, and of the skin, and the nervous system. Dr. Manson, of Chesterfield, has described and discussed the merits of the Strathpeffer Spa in a short treatise, published by Messrs. J. and A. Churchill.....”—*The Illustrated London News*.

“The Strathpeffer Spa has a well-merited reputation even so far south as London, and to anyone who knows it not, and who desires to try sulphur waters, we can, relying on trustworthy medical information, confidently suggest a visit to Strathpeffer. The place is easy of access, and picturesquely situated, and the visitor, whether he be an invalid or merely a seeker after new scenes, will find abundant information regarding it in this new edition of Dr. Manson’s valuable little book.....”—*Vanity Fair*.

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"This little work.....will be found a useful guide to persons intending to try the Strathpeffer waters..... The author states concisely what he believes to be the rationale of the curative process A very useful portion of the book is that which contains the analysis of the Spa waters....."—*The Examiner*.

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"Dr. Manson has issued a second edition, revised and brought up to date.....for the waters of which he claims greater curative efficacy than belong to those of any other watering-place in Great Britain."—*Scotsman*.

"Attention is called in this little publication to the Strathpeffer waters and their value as a restorative agent. It appears that these sulphur springs are the first of their class in Great Britain, and in these days of commercial depression, physicians and the health-seeking portion of the community, would do well to consider the advantages of Strathpeffer as a summer retreat. Dr. Manson gives copies of reports on examinations of the waters made at different times by Drs. Murray Thomson and Stevenson Macadam. The concluding portion of Dr. Manson's *brochure* contains descriptions of the various places of interest and resort in the neighbourhood of the wells."—*The Edinburgh Courant*.

".....We are glad to notice the issue of a second edition, the want of which was much felt..... Dr. Manson, who was for several years resident physician at Strathpeffer, thinks it is a mistake to suppose that the good to be derived from the Spa is confined to the summer months..... The medicinal power of the waters is remarkable among the sulphurous waters of Europe. Dr. Manson assigns to them as a speciality, that their tendency is to be absorbed by the stomach and intestines, and received through the liver into the general system....."—*The Inverness Courier*.

"We have here.....a very comprehensible and satisfactory hand-book of the famous Strathpeffer Spa..... That Strathpeffer is destined to a still wider popularity there would seem every reason to believe In view of facts fully stated, the suggestion that, before rushing away to foreign Spas, seekers after health and pleasure should look to the claims of Strathpeffer, seems to be eminently reasonable."—*Aberdeen Daily Free Press*.

".....It is the only book relating to Strathpeffer Spa..... Dr. Manson assigns Strathpeffer its place among the Spas of Europe..... shows that arrangements for residence and enjoyment are unexceptionable It is of great consequence to the health-seeking public, likely

to be benefited by residence near sulphuretted waters, to have an authoritative statement like that of Dr. Manson, as to the character of Strathpeffer Wells....."—*Banffshire Journal*.

".....Strathpeffer is now a strong claimant for popular favour, which it undoubtedly deserves..... Dr. Manson's guide is concise, and gives all needful information..... There is an absence of interested motives in this little work which strongly recommends it to the notice of the public."—*Cook's Excursionist*.

"This is an interesting work by Dr. Manson of Chesterfield, on the sulphur waters of Strathpeffer, a comparatively new watering-place in the Highlands of Ross-shire. It is dedicated by permission to the Duchess of Sutherland, who is the owner of the Strathpeffer Spa, and contains besides a careful chemical analysis of the extraordinary waters of this Spa, a full description of the locality, couched in a lively and fluent style. Strathpeffer, the author tells us, is twenty-five miles north-west of Inverness and five miles from the Dingwall Station of the Inverness and Ross-shire Railway. It is situated amidst scenery of great natural beauty, and possesses a climate dry, bracing, and salubrious." "In the 'Statistical Account of Scotland for 1841,' Strathpeffer is stated to be 'one of the purest and most salubrious spots in Great Britain,' and Dr. Manson tells that his experience is, that the cold in central England is felt much more than at this Northern Spa. The chief attraction, however, of Strathpeffer must be the mineral waters, and it may surprise our readers to find, that in strength the Strathpeffer waters are probably superior to most in Europe. They are sulphur waters of the same class as the Harrogate, Moffat, and Aix-la-Chapelle springs, but Dr. Manson tells us that whereas at Aix, there are 4 grains of sulphur to the gallon, and at Harrogate 8 grains, at Strathpeffer the water contains no less than 30 grains. With regard to the sulphuretted hydrogen gas, Strathpeffer contains 11.26 inches and Harrogate 5.31 inches. The most powerful action of the waters is on the kidneys, and they are especially beneficial in rheumatism, gout, and cutaneous diseases, also in many cases of indigestion. In some of these diseases Dr. Manson speaks from personal experience of really extraordinary cures..... The second part of Dr. Manson's exhaustive little book is devoted to the scenery, which surrounds the Spa, and, judging from his description we should think visitors would have no dull hours unless from their own fault. There are also chapters on the geology and botany of the district, and in fine it is difficult to see what Dr. Manson has omitted which is likely to be of value to the visitor, whether invalid or tourist. We feel sure that the book will be of interest to all who take it up, whilst Dr. Manson has undoubtedly done great service to many sufferers in making better known a Spa possessing such extraordinary natural advantages."—*Derbyshire Times*.

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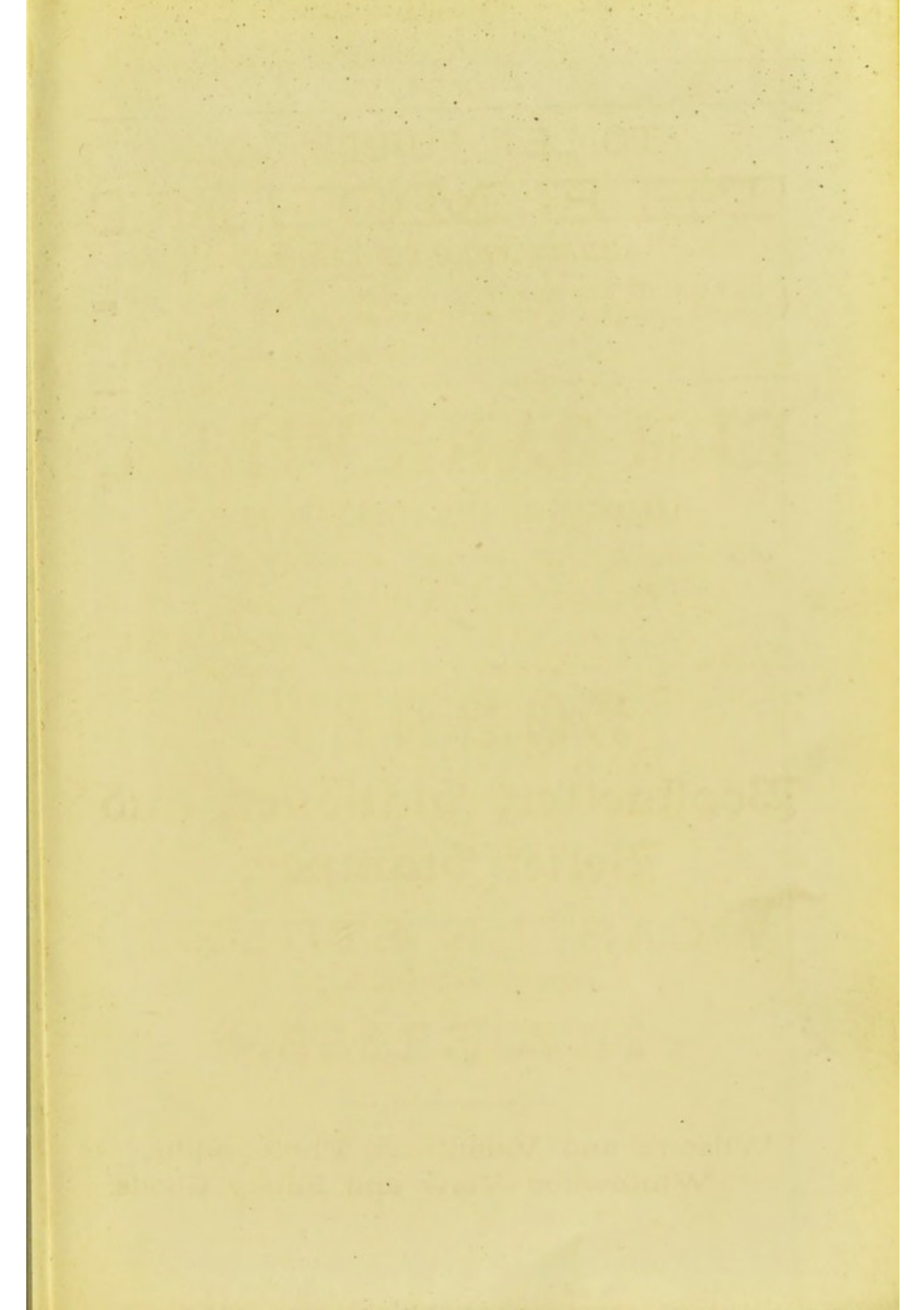
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