I now pass on to consider the facts relative to the rain, rainfall, and relative humidity of the atmosphere at San Remo. Various particulars in relation to these points are clearly exhibited in Table V.

TABLE V.—*Rain and Rainfall.*

	Days of Day Rain.	Hours of Day Rain.	Rainfall.	Mean Relative Humidity.	Highest Humidity.	Lowest Humidity.	
November ..	6	h. m. 31.30	Inches. 2.40	65.6	94.4	44.2	Strong N.W., W., and N.E. winds.
December	3	20.00	1.65	58.7	93.1	33.3	Strong N.E. wind.
January	1	.10	.08	63.2	84.6	44.2	Strong N.E. wind.
February	5	27.00	2.70	74.0	95.8	53.0	
March	3	3.00	.20	75.0	85.9	47.7	Strong N.E. wind.
April	9	35.30	3.30	70.6	84.6	50.6	S.E. gale.
	27	117.10	10.26	67.8			

Observations.—When only a few drops of rain fell, and the quantity was too small to be measured, they were not included. There were three days in November and three in February when this occurred. The figures of the rainfall are calculated from the register of the Observatory at San Remo.

It thus appears that there were but twenty-seven days on which a measurable quantity of rain fell; that the period during which it actually descended embraced only 117 hours, between 9 A.M. and 9 P.M.; and that the total rainfall amounted to but little over ten inches; further, that the mean relative humidity of the air for the whole season certainly did not exceed 67.8°, if it were as much. Thus I find that there is very considerable difference between my observations relative to the dryness of the atmosphere and those taken at the Observatory at San Remo. According to the observations at the latter place, the mean monthly humidity was as follows: for November, 60.5°; December, 46.0°; January, 54.9°; February, 66.3°; March, 62.8°; April, 66.4°—the mean of the whole season being 59.5°, against my mean of 67.8°. This difference is to be explained, I believe, by the instruments at the Observatory being placed very high above the ground, and even above surrounding vegetation—namely, at an elevation of sixty-four feet.

But there is still another element to be taken into consideration, as exercising an important influence on the climate of San Remo, and, indeed, of the Riviera generally—namely, the temperature of the Mediterranean Sea itself. The more important particulars in reference to this subject are exhibited in Table VI.

TABLE VI.—*Sea Temperature.*

	Mean Temperature.	Highest Temperature.	Lowest Temperature.	Mean Temperature of Air.	Sea Warmer than Air.	Greatest Difference.
November	9 A.M. 60.2	9 A.M. 63.2	9 A.M. 58.8	9 A.M. 52.6	9 A.M. 7.6	9 A.M. 19.6
December	53.8	56.4	51.6	43.5	10.3	18.4
January	52.8	54.9	52.1	45.5	7.3	16.4
February	53.8	55.0	52.2	50.0	3.8	6.7
March	55.2	56.2	52.1	55.0	.0	6.0
April	57.4	60.4	55.7	59.9	2.5†	8.8†

‡ In this month, the sea was 2.5° colder than the air.

† The air was on one occasion during this month 8.8° warmer than the sea at 9 A.M.

It is thus seen that the sea was considerably warmer than the air at 9 in the morning during the whole winter season, with the exception of a very few days only, the difference in some cases amounting to nearly 20°; and hence, that its influence must be very considerable in increasing and equalising the temperature of the air, especially during the night. Indeed, so warm is the sea at San Remo that there is scarcely a day during the whole winter when bathing, to a healthy Englishman, would not be agreeable, and for the most part beneficial.

It thus appears that the climate of San Remo, during the winter season of 1879-80, was rather above the usual average temperature; that it was very bright and sunny; that there were very few days on which rain fell; that the air was, on the whole, dry, but not excessively or undesirably so—in fact, that it possessed all those conditions and qualities of climate which have placed San Remo in the foremost rank amongst health-resorts. During the ensuing winter season, I propose not merely to resume my meteorological observations, but to extend them, so as to include some further particulars. Although much statistical information has been collected illustrative of the climate of San Remo and the Western Riviera, yet the subject is by no means complete; and some of the observations made and recorded are open to the objection that they have not been taken on the best, or indeed on any uniform system.

THE WATERING-PLACES OF THE AUVERGNE: SAINT NECTAIRE AND LA BOURBOULE.*

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SAINT Nectaire and La Bourboule, the places to which I wish to direct attention in this communication, are situated on the southern border of the district already referred to, the Mont Dore lying between them. Both St. Nectaire and La Bourboule are highly recommended for the treatment of scrofula or struma, and for what the French medical men are fond of calling "lymphatism", the description of which I give here in the words of Dr. Dumas Aubergier, medical inspector of the mineral waters of St. Nectaire Le Haut and St. Nectaire Le Bas.

"Among children", he says, "there is often observed a state intermediate between health and disease; a state in which the circulation, the secretions, the respiration, present nothing abnormal; and yet the life is subject to certain disorders. There is noticed a full belly, and the limbs are developed slightly in comparison with the head and the body. The gait is often slow or uncertain. Fatigue is very easily induced. At other times, the excretions are passed involuntarily, that of the urine in particular. From these symptoms, we can often recognise a lymphatic constitution, or the precursive signs of rachitism." The invention of the term "lymphatism" seems to indicate the opinion that it is in the lymphatic glands and ducts that the origin of the state above described is to be found. Certain it is that, in this condition, the glands tend to become affected. But they are not by any means alone in the indications of weakness and disease, for these are shared along with them by the bones, joints, skin, teeth, and sense organs—the tissues, in short, formed from the outer or serous layers of the embryo. Among the surgical out-patients of the Bradford Infirmary, about one-third of the applicants for relief suffer from some form of strumous or scrofulous affection, a fact which gave the treatment of these intractable, chronic, and generally subacute cases a special interest.

Saint Nectaire consists of two villages separated from one another by about half a mile, and called respectively the high and the low. The former is the one at which I stayed, though I visited the other, and inspected the establishment and springs. Hardly anything can be more charming than the situation of St. Nectaire Le Haut. It is about 2,400 feet above sea-level (latitude about 46° N.), and yet vines grow all along the hillsides, so fertile is the soil, and so genial the sun. The vines are not so fine as those in the valley at Clermont, still less are they equal to the luxuriant spreading runners of the Italian peninsula; but still they are very fair vines. The village is hardly more than a name, for it contains very few houses on the hill-top, and these only poor hovels; while the sanitary condition is as atrocious as it is usually found in French villages. The chief hotel is, however, well appointed, well drained, not expensive, well patronised by cheerful and often aristocratic visitors, and beautifully situated on the south face of the Mont Cornadore, which shelters it from the north. To the west is a large hill covered with pine-woods, among which are laid out pretty walks, with seats in shady places. South-east from the hotel is a small hill, surmounted by a Byzantine church dating from the sixth century, though the oldest part of the present structure dates only from the eleventh century. Beyond the church is the village. If the visitor cares to make the easy ascent of the Mont Cornadore, which he can do in from fifteen to twenty minutes through the pine trees, he can have a magnificent view of the Pic de Sancy and the neighbouring hills, of the ancient Château de Murols, of the Puy de Tartaret, and the Gorge d'Enfer, while he can almost hear the ripple of the Couze, as it winds along its cheerful way to join the Allier.

The Establishment is an appanage of the hotel, to the enterprise of whose proprietor, M. Versepuy-Mandon, it in fact owes its existence. It is built of whitish-yellow stone like the hotel itself, and presents a very tasteful appearance. The central portion forms a kind of hall, having a glass roof, and furnished with plants. On to this hall open the thirty *cabinets de bain*, arranged in the usual manner, with large baths and douches, hot and cold, similarly to the method employed at the Mont Dore. The medical man arranges, of course, as to the duration, temperature, etc., of the bath in each case. There is at St. Nectaire no *salle d'aspiration*.

The waters of St. Nectaire le Haut are obtained from two principal springs: that of the Mont Cornadore, furnishing about 79,000 litres in twenty-four hours, while that of the Rocher supplies 15,000 litres. The former has a temperature of about 41° C. (106° F.), and the latter of 43° C. (110.6° F.). Besides the bath service, there are, at Saint

Nectaire le Haut, arrangements for foot-baths, for douches, and for baths of carbonic acid gas, and apparatus for pulverisation by means of douches for the eye, the larynx, and various other parts. The analysis of the chief spring at the Mont Cornadore is given below, along with the analysis of the Source Rouge, which, it will be observed, contains rather more than a quarter of a *gramme* of bicarbonate of lithia to the *litre* (about $1\frac{3}{4}$ gr. to 16 oz.*). The presence of lithia has been supposed to render this spring very suitable for the treatment of the gouty diathesis.

The waters of Saint Nectaire le Bas, as appears from the table given below, do not differ very much in composition from those of Saint Nectaire le Haut. They are more highly mineralised than the Mont Cornadore spring, but not so highly as the small Source Rouge. The waters of low St. Nectaire were more frequented, it is said, by the Romans, than those of high St. Nectaire; and at the former we find springs still named Bains Romains, in memory of the time when the Romans visited them.

There are two principal springs at Saint Nectaire le Bas, that of Boette, and that named Mandon. The constituents are here given, after the analysis of M. Lefort and others.

Analyses of the Waters of Saint Nectaire.

Name of Spring.....	Saint Nectaire le haut.		Saint Nectaire le bas.	
	Mt. Cornadore 42° C., = 107.6° F.	Source Rouge, used for drinking.	Boette 40.9° C., = 105.62° F.	Mandon 37.5° C., = 99.5° F.
Substances:	<i>Grammes to Litre.</i>	<i>Grammes to Litre.</i>	<i>Grammes to Litre.</i>	<i>Grammes to Litre.</i>
Free carbonic acid ..	0.9464	1.7042	0.8600	1.5308
Chloride of sodium ..	2.1464	2.3954	2.7633	2.4142
Iodide of sodium ..	Traces	—	—	—
Bicarbonate of soda ..	2.0001	2.7007	1.9511	2.0881
„ lime ..	0.6480	0.7875	0.6590	0.7060
„ potash ..	0.0466	Traces	0.0471	0.0407
Bicarbonate of mag- nesia ..	0.4384	0.4390	0.4681	0.4805
Bicarbonate of pro- toxide of iron ..	0.0122	0.0194	0.0115	0.0097
Bicarbonate of lithia ..	—	0.2691	—	—
Sulphate of soda ..	0.1309	0.1864	0.1609	0.1781
Sulphate of strontia ..	0.0070	—	0.0070	0.0070
Sulphate of lime and baryta ..	—	0.0029	—	—
Arsenate of soda ..	Traces	Strong Traces	Traces	Traces
Phosphate of soda ..	—	—	—	—
Borate of soda ..	—	0.0081	—	—
Alumina ..	0.0171	0.0330	0.0270	0.0205
Silicic acid ..	0.1044	0.0861	0.1128	0.1036
Organic bituminous matters ..	Traces	Traces	Traces	Traces
Totals ..	6.5155	8.6318	7.0642	7.5308

From this analysis, it will be seen that these waters may be described as natural alkaline thermal waters, whose properties must be mainly dependent on the comparatively large quantities of bicarbonate and chloride of sodium they contain. When I was at Saint Nectaire in July 1879, people were much excited by the analysis of the water of a new spring called the Source Mercurielle du Rocher au Mont Cornadore. This spring contains, it is said, .0088 *grammes* of silver, mercury, and arsenic together in the *litre*, or .0616 grains to 16 oz. The excitement arose from the hope that the presence of the mercury might make the water valuable in the treatment of syphilis. It is not ascertained in what form the mercury exists in the water. A good deal will depend on this, but a tumblerful of the water would contain about one-sixtieth of a grain of corrosive sublimate or biniodide of mercury, a respectable dose, which could hardly fail to be useful in suitable cases.

The physiological effects of the waters of Saint Nectaire are the following. When drunk, even in small quantities, the water is generally heavy; it is alterative and constipating. But, after a while, if the bather continues the use of the water, and increases the doses daily, he finds his constipation soon replaced by diarrhoea, which sometimes becomes so severe as to compel him to cease taking the water. These effects are no doubt due to the sulphate of soda and to the magnesia contained in the springs, although it is remarkable how small a quantity (about 1 grain of the former, and about 3 grains of bicarbonate of magnesia to the 16 oz. avoirdupois) of these salts can act in this way in a natural mineral water, when compared with the very much larger

doses which would have to be given, were the salts mixed in the laboratory of the pharmacist. Attention has already been drawn to this fact by Sir Henry Thompson, among others. The quantities of sulphate of soda and of magnesian salts contained in the Saint Nectaire waters are, however, very much smaller than those found in the waters more usually ordered as laxatives, such as Friedrichshalle and Carlsbad. This point will be referred to further on.

Before proceeding to the therapeutic indications for the use of the waters of Saint Nectaire, I will say something about the composition of those of La Bourboule, and then take the therapeutic indications for both places together. La Bourboule lies about four miles further down the Dordogne than the Mont Dore, and at a considerably lower altitude (3,000 feet) above sea-level. It is, therefore, considerably warmer than the Mont Dore, the temperature rarely falling below 55° Fahr., while it often reaches 85° Fahr.; but it is also less beautifully situated than either the Mont Dore or Saint Nectaire, presenting a somewhat untidy appearance, owing to the number of unfinished buildings in course of construction for hotels, lodging-houses, etc. The village is well sheltered by the neighbouring mountains from the north and west, and has a good southern and eastern exposure. The bathing establishment is large and commodious, and public gardens are being laid out behind it, which will much add to the amenities of the village. The arrangement of the baths is similar to those of the Mont Dore and Saint Nectaire. There are four principal springs at La Bourboule, of which the hypothetical composition is here given.

Name of the Spring ..	Perrière.	Sedaiges.	Fenestre No. 1.	Fenestre No. 2.
Temperature ..	At the surface of the water, 133.70° F. At the bottom of the well, 140.18° F.	At the surface of the water, 113.9° F. At the bottom of the well, 138.92° F.	66.38° F.	65.56° F.
Substances:	<i>Grammes to Litre.</i>	<i>Grammes to Litre.</i>	<i>Grammes to Litre.</i>	<i>Grammes to Litre.</i>
Metallic arsenic ..	0.00705	0.00689	0.00096	0.00104
or	—	—	—	—
Arsenious acid ..	0.01031	0.01054	0.00147	0.00159
or	—	—	—	—
Arsenate of soda ..	0.02347	0.02776	0.00385	0.00418
Free carbonic acid ..	0.0513	0.1662	0.0336	0.1654
Chloride of sodium ..	2.3406	2.6102	0.1925	0.1360
„ potassium ..	0.1623	0.1427	0.0129	0.0310
„ lithium ..	Traces	Traces	Traces	Traces
„ magnesium ..	0.0320	0.0243	—	—
Bicarbonate of soda ..	2.8920	2.1106	0.5862	0.9357
Bicarbonate of lime ..	0.1905	0.1501	0.0206	0.0234
Bicarbonate of mag- nesia ..	—	—	0.0125	0.0197
Bicarbonate of pro- toxide of iron ..	—	—	0.0125	0.0197
Sulphate of soda ..	0.2034	0.1730	0.0213	0.0374
Peroxide of iron ..	0.0021	0.0013	0.0213	0.0374
Silicic acid ..	0.1209	0.1170	0.0796	0.0794
Alumina and organic matters ..	Traces	Traces	Traces	Traces
Total salts to litre ..	6.4997	5.5009	0.9413	1.4826

It will be observed that the first constituent of the water of La Bourboule is arsenic, to which the first place has been accorded because it is considered the most important. If it exist in the form of arseniate of soda, which is possible, the .028475 *grammes* to the *litre* would be represented by .199325 grains to sixteen ounces avoirdupois, or say one-fifth of a grain, or one-sixtieth of a grain to the ounce. The arseniate of soda is highly esteemed on the Continent, though little used here. The French medical men say it is much less irritating than the arseniate of potash, which is the basis of Fowler's solution. As each of the small tumblers in use for drinking the waters contains about a quarter of a pint, about one-twentieth of a grain of the salt will be so administered at each dose; and it will be readily seen that three such doses daily may exert a very powerful influence on susceptible persons, and particularly on children.

Physiological Effects of the Waters of La Bourboule.—Taken internally, these waters cause a sensation of warmth to the stomach, and alter and much diminish the appetite. The stomach feels full, and the intestines become torpid; and there is constipation. In spite of this, however, patients do not lose flesh, while many even increase in weight. The systemic circulation is much excited, almost to feverishness; and, under the influence of the excitement conveyed to the capillary circulation, the skin becomes dry and burning, any acne-points on the face becoming deeper in colour; and itchiness of the skin becomes almost intolerable.

* It may be observed in passing that so many *grammes* to the *litre* can be converted roughly into grains to the one pound avoirdupois, by simply multiplying by 7; as the following proportion shows. 1 *gramme* = 15 grains nearly. 1 *litre* = 1000 *grammes* = 15,000 grains nearly. Then x *grammes* to *litre* = $7x$ grains to 1 lb. avoirdupois. Thus $15,000 : x :: 15 : 7x$ = grains to 1 lb. avoirdupois.

The respiratory tracts are also excited; there is dryness of the throat, which gives place to a painful constriction of the muscles of the larynx; there is a diminution of the bronchial secretion, followed by a fatiguing cough without expectoration; and there may even be hæmoptysis, epistaxis, or metrorrhagia, which may compel a cessation of the treatment. The excitement of the nervous system is shown by diminution of sleep, and in the need felt for exercise, the contractility of the muscles of locomotion being much increased. In short, the general physiological effect of these waters may be described as excitant.

For purposes of comparison, I have put down here the quantities of the principal salts contained in some of the best known foreign springs.

Alkaline Waters.

	Sod. Bicarb. Grains.	Sod. Sulph. Grains.	Mag. Sulph. Grains.
Vichy (Celestins), contains in 16 ocs.	35.7	2	—
Vals (Magdeleine) ..	52.	—	—

Saline Springs.

	Sod. Bicarb. Grains.	Sod. Sulph. Grains.	Mag. Sulph. Grains.
Friedrichshalle ..	—	41	39
Pullna ..	—	123	93
Marienbad (Kreuz) ..	7.2	38.4	—
Carlsbad (Sprudel) ..	10.4	20	—
Franzensbad ..	5	24	—

From this it appears that, while the waters of La Bourboule and Saint Nectaire may both be classed among the alkaline waters, the quantities of bicarbonate of soda they contain are much less than those contained in the Vichy and Vals waters. The quantities of sulphate of soda and of magnesian compounds contained in them are also very much smaller than those contained in saline springs like Pullna, Friedrichshalle, etc.

Therapeutic Indications.—As the waters of Saint Nectaire and La Bourboule are both used for the treatment of similar affections, we may consider their uses together. The superior richness in arsenic of the springs of La Bourboule gives its waters a wider range of efficacy in the treatment of skin-affections; and, mainly because those of Saint Nectaire contain less of this substance, they are more suitable for children of tender years. The chief class of affections for which both sets of waters are employed is that termed scrofulous. French writers divide these affections into three classes: that already referred to under the name of lymphatism; that which they term scrofula; and, lastly, chloro-anæmia. By scrofula they mean hypertrophy of the glands, with or without ulceration, otorrhœa, ozœna, caries, necrosis, coxalgia, and some affections of the skin. By chloro-anæmia they mean what is called chlorosis with us—a condition in which there is very scanty menstruation, sometimes complete suppression, often preceded by menorrhagia, and sometimes alternating with that condition. For the treatment of this state, the Source Rouge at Saint Nectaire is much recommended; and, as it is a ferruginous water, we have no difficulty in understanding its efficacy in this direction. Crowds of scrofulous children go annually to Saint Nectaire, and may be recognised by their stunted growth, large heads, broad flat expanded noses, thick lips, and pale complexions; or they may actually have ganglionic enlargements about the neck, or disease of the bones or joints. Such children, if properly treated, derive great benefit from the course at Saint Nectaire; but it is a course which requires careful supervision and no small skill on the part of the medical attendant. There can be no doubt that the system of warm baths, and the drinking of waters containing bicarbonate and chloride of sodium, exerts a very powerful resolvent action upon the tissues, and may also prove very exhaustive to children of tender years; and, in point of fact, the diarrhœa which sometimes ensues after the preliminary constipation, with the weakening sweats which accompany it, require very careful management, and often involve the cessation for a time of the whole treatment. The skill of the doctor is shown in avoiding these disadvantages by not pushing the treatment too far, especially at the commencement. Some doctors think it proper to induce this exhaustive condition, which is frequently accompanied by feverishness at the commencement of the treatment; but even these do not recommend such a course in the case of children, to whom it is obviously unsuited.

After the full description which has been given of the mode in which the waters are applied at the Mont Dore, I need do no more than say that all the methods of application there used, except the use of the *salle d'aspiration*, are also followed at Saint Nectaire and La Bourboule. Under the application of a fine jet of mineral water frequently repeated, ganglionic enlargements, if in the first stage, and before supuration has commenced, may be seen gradually to resolve, and finally to disappear. The process by which this is effected is interesting. Each tumour formed by one or more enlarged ganglia appears to divide into two almost equal parts; each of these again into two smaller portions; this process continuing in smaller and smaller subdivisions, until

finally the whole growth disappears. This complete disappearance may not be effected during the actual course of treatment; but, once started, it continues very often until the cure is effected after the patient has left the watering-place. As is well known, the water-jet may be a very powerful application, whose use, therefore, requires a good deal of skill. It may be so strong as even to perforate the skin of the patient; and there are some tender skins which can scarcely tolerate it in any circumstances. It is in these cases that the process known as *pulverisation* is so useful. In this mode of application, a burnished metal surface is introduced between the jet and the surface on which it is desired to play the spray; or a finer or coarser sieve may be interposed, and the jet directed against it. In either case, the coarse jet is broken up into a fine spray or powder, and so made to impinge much less forcibly against the part affected. The jet itself may be used for the treatment of ganglionic enlargements about the neck, or for chronic synovitis in the knee or other of the larger joints; but when scrofulous affections of the eye are to be treated, or those sluggish ulcerations of the skin to be seen in strumous children, the jet is too powerful, and the pulverisation is much more appropriate. Under this application, chronic inflammatory affections of the eyes, tinea ciliaris, conjunctivitis, blepharitis, and keratitis, which may long have resisted other treatment, are speedily relieved. Numerous cases are detailed by Dr. Dumas Aubergier; but space does not admit of their quotation here. The impingement of the spray against the eye seems to stimulate the inflammation; and, profiting by what I witnessed at Saint Nectaire last year, I have been able quickly to overcome what had been a very intractable and prolonged case of keratitis in a strumous subject. As showing that the mode of application may be as important as the composition of the water with which the eye is douched, I may say that the spray with which I treated the eye in question consisted of half a grain of sulphate of zinc to the ounce of water, and was the very same application which had been used for weeks before as a lavement without any apparent benefit. When the jet is applied to the ulceration of the skin found in strumous children, it acts as a stimulus or spur (or, as the French writers expressively term it, as a *coup de fouet*) to the sluggish inflammation, which soon takes on more healthy action. In the case of chronic synovitis then, alternation of strapping with the jet or pulverisation ought to prove an useful combination of remedies; but I have not yet had the opportunity of putting this mode of treatment into operation, though I have found it very useful in strumous ulceration of the skin.

In the treatment of rheumatism, the waters of Saint Nectaire are very efficacious. Among children, heart-disease as a complication of rheumatism is quite as common as among adults, and the statements made concerning the power of these waters over such affections are certainly remarkable. Thus M. Vernière writes, after describing the anxiety felt by him at the advent of such cases, and his hopelessness of benefiting them: "Later, it was not without astonishment that I saw these patients become less oppressed in breathing, and the heart's action becoming stronger and more regular." "I have seen", he says, "the harshest murmurs gradually becoming softer, and sometimes even disappearing; the size of the heart itself, determined with the greatest care by percussion, lessening considerably; and the area of the field of dulness growing less. *I have no longer any doubt on this point; I have positively determined it.*" This is a striking statement; but it is corroborated by other authorities—e.g., Dr. Raymond, Dr. Pipet, etc. Rheumatic neuralgia also is, as a rule, much benefited by this treatment.

In the treatment of some of the diseases of women, Saint Nectaire enjoys a high reputation. Leucorrhœa, amenorrhœa, dysmenorrhœa, thickening of the cervix, with or without ulceration, and, finally, sterility (which, of course, may be dependent on these or other causes), are all successfully treated there. The course of treatment in these cases may be described as general and local. General treatment ought not to be neglected, and consists in drinking the water; in tepid baths; douches over the whole body, on the back, and on the inside of the thighs and the lower limbs. In addition, baths of carbonic acid gas are of much use in these affections; and at Saint Nectaire the gas used for this purpose is collected over the surface of the bubbling water in a large iron vessel like a gasometer, from which the gas is run off in pipes to fill the baths. Carbonic acid gas induces a feeling of heat in the parts to which it is applied, particularly if the skin is thin or has a rich nervous supply. There is a feeling of formication, with momentary and local anæsthesia, followed by perspiration. The therapeutical effects are excitant of nerves and vessels; sedative of pain, particularly of that which has its seat in the neck or body of the uterus; antiseptic; chemical, decomposing the phosphates and urates which form the basis of some vesical calculi; and, finally, stimulant of the appetite. The effects in uterine affections are to relieve pain, which it does in a very remarkable manner; and resolvent of thickenings about the neck or body of the uterus, and of chronic ovaritis. It is even

asserted that ovarian cysts have been cured by these means; but, without attaching too much importance to this statement, it is at least possible that ovarian tumours may thus be prevented in the earliest stage. Locally, douches and injections are freely used, and with the best results. In overcoming sterility, the effects are so remarkable as to have given to one of the springs the name of *Source des Garçons*.

For scrofulous affections of the skin, the arsenical waters of La Bourboule are in high favour. Eczema, pityriasis, psoriasis, all yield to their curative influences, particularly the scrofulous and rheumatic forms of these diseases.

As in the case of the Mont Dore and other similar watering-places, some of the beneficial results experienced by bathers are no doubt attributable to the change of air and scene, to the beautiful scenery and the pleasant outdoor life; but, after due allowance has been made for all of these concomitant advantages, I think I have said enough to show that the course of treatment at Saint Nectaire and La Bourboule is specially valuable in rheumatic affections, and in the treatment of scrofula in its various manifestations in the lymphatics, the bones and joints, the sense-organs, the skin, and the uterus and its annexes.

NOTES ON THE MINERAL WATERS AND CLIMATE OF SPA.*

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SINCE the middle of the sixteenth century, the chalybeate springs of Spa have enjoyed the reputation of being therapeutically some of the most valuable in Europe. In the eighteenth century, they were more frequented than perhaps any others, and formed a centre round which a large share of the wealth and fashion of the Continent used to meet. Of later years, this has, to a certain extent, ceased to be the case. The abolition of gambling has considerably diminished the number, while it has improved the quality, of the visitors who annually resort to Spa. Those who come now, come, as a rule, mainly in search of health. They live temperately and moderately, and rarely fail to derive considerable and permanent benefit from their sojourn at these springs. No mineral waters, perhaps, in suitable and properly selected cases, are capable of effecting so much good in such a short space of time as those of Spa. But to do this the cases must, in the first place, be such as require a tonic course of treatment; and, in the second, that treatment must be carried out, both on the part of the patient and the physician, with judgment and discrimination. The physiological action of the various chalybeate springs of Spa is by no means identical. No greater error, indeed, can be made, than that of treating in a routine way, and without attention to individual peculiarities, even those cases in which Spa waters are pre-eminently suitable. Each case must be treated on its own merits; and it is in the choice of the particular spring, and in the mode in which its waters are prescribed, that the special skill and local knowledge of the practitioners is chiefly shown.

Comparing Spa with two well known, and at present fashionable, watering-places—Schwalbach and St. Moritz—we are at once struck by the much larger amount of iron which is held in solution in the springs of Spa. Thus the two Pouhon springs of Spa contain respectively three times more iron than the Stahlbrunnen and Weinbrunnen of Schwalbach, and from six to eight times as much as the Paracelsus spring of St. Moritz. But, while thus rich in the actual amount of chalybeate matter which they contain, they are still more rich in the quantity they contain proportionately to other ingredients, such as the earthy and alkaline salts. Thus, taking the series of the alkaline bicarbonates, we find that, representing the amount contained in the two Pouhon springs just mentioned by the numbers 1.8 and 5.9, the amount contained in the Weinbrunnen of Schwalbach would be represented by 12.1, and that in the Paracelsus of St. Moritz by 16.9. On the other hand, the amount of free carbonic acid is slightly in favour of Schwalbach, and St. Moritz as compared with Spa, viz., for the first, 27.1; for the second, 33.6; and for the Pouhon of Spa, 25.5. It is this richness in iron, both actually and relatively, which constitutes at once the chief virtue and the chief drawback in the Spa waters. It is this which, in suitable cases, makes their action rapid and beneficial, and which in unsuitable cases rapidly aggravates the patient's symptoms. Consequently, there are few waters which require more care in their administration than those of Spa, and few also in which a satisfactory result can be so speedily and confidently promised when once they have been found to be in harmony with the patient's requirements and temperament.

It would be impossible to give, even briefly, a sketch of the various

morbid conditions for which the waters of Spa have from time to time been vaunted as almost specifics. Such indiscriminate praise is entirely at variance with the severe and scientific methods of modern medicine; and, moreover, utterly defeats its own object. It causes annoyance to the physician, intense disappointment to the patient, and brings unmerited censure on a really valuable therapeutic agent. I will, therefore, state at the outset what I venture to consider as distinct contraindications to the use of the Spa waters. Every year, patients come to these springs, frequently without having obtained any medical advice whatever as regards their choice of a spa, stay here some days, and depart considerably worse than when they arrived. As a rule, such patients belong to one of two classes; they are either plethoric subjects, with a tendency to attacks of acute gout, and a threatening of cerebral or other congestions; or they are phthisical patients, with abundant hæmoptysis and a well marked hectic condition. In the first class of invalids, the state of chronic congestion in which many of their internal organs are increased; in the second, the stomach is quite unable to absorb or assimilate the amount of iron in the waters, the heart's action is deranged and accelerated, and a fresh burst of hæmorrhage is often the result. Invalids belonging to either of these two categories should not visit Spa for the purpose of drinking its waters, although they may, with perfect safety and even benefit, resort to the mineral baths, or enjoy the bracing mountain-air of the high table-land of the Ardennes, on which Spa is situated. There are, however, in addition to these two classes, a large number of invalids who come hither, to whom, on their first arrival, the waters cannot be at once ordered with advantage. Among such, I may mention women at the epoch of the menopause, who suffer from more or less abdominal congestion, with palpitation of the heart or frequent headaches. In these cases, a week or so of preliminary exercise and careful dieting, together with the use of baths, will frequently be sufficient to enable them to assimilate the waters, from which they will eventually derive much benefit. There is also another set of cases which require very careful treatment. They are met with chiefly, though not entirely, in girls or young married women in whom the nervous system is in extreme disorder, and in a state of unstable equilibrium. Such persons are the victims of intense irritability, in which every organ of the body, the stomach included, shares. These patients frequently find it impossible, during the early days of their sojourn at Spa, to assimilate the waters; and it is worse than useless in such cases to press them. Tepid mineral baths, with or without graduated douches, often prove very beneficial. They calm the peculiar condition of nervous irritability present, and thereby prove quite as efficacious as the chalybeate waters, which, moreover, can generally be had recourse to with still further advantage at a later period.

On the other hand, the mineral waters of Spa are pre-eminently indicated in that large group of diseases which may be classed under the heading of *anæmia*. There may be *anæmia* from nervous exhaustion, *anæmia* as a direct result of the physiological insufficiency of any organ or group of organs, and *anæmia* from excessive or deficient secretion or excretion, either locally or generally. This *anæmic* or *spanæmic* type of disease is one which has assumed increased importance in recent times, and is more or less intimately connected with the growth and development of modern civilisation, especially in the great centres of population and industry. *Anæmia* is a symptom daily becoming more common, at least among the patients who resort to these springs. Tonic treatment is now undoubtedly often required where, one or two generations ago, depletion would have been as imperatively called for. It is in these cases of what I will venture to call "*vital weakness*," with or without localised or functional lesions, that the Spa waters are eminently beneficial. It matters not, apparently, whether the *spanæmia* present be due to a disordered condition of the chylipoietic viscera or of the uterus, of the lungs or of the nervous system, or whether it be dependent on some subtle change in the constitution of the vital fluids themselves, apart from any appreciable local manifestations. Whatever the cause be, the result of the use of these waters in this great subclass of disease is apparently always the same, namely, temporary or permanent improvement.

Among the various forms of *anæmia*, there is one to which I would wish to draw especial attention; I mean climatic *anæmia*. Perhaps no class of cases derive so much benefit, and in so short a time, from the ferruginous waters of Spa as this. I have lately had under my care an English lady, whose health had been completely broken by a prolonged residence in the moist and relaxing climate of Brazil. After taking the waters for one week, a marked improvement was visible. In this case, they agreed better than they sometimes do; nevertheless, in the form of *anæmia* referred to, their action would appear almost that of a specific. I have seen the greatest benefit from their use among persons whose health had been undermined by long residence in tropical and

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