aneurysm and lung tuberculosis than the bilateral form. Thus, out of twenty-three instances I find that nine arose from aneurysm and five from tubercle. Of these Semon¹⁰ has collected sixteen cases, and seven have come under my notice. From a pathogenetic point of view the unilateral paralysis possesses a much greater importance than it does when regarded as a purely local lesion. Owing to the intimate relations of the recurrent nerves with the arteries within the chest, thoracic aneurysm or other tumours may produce this paralysis as a symptom of their presence long anterior to any other phenomenon clinically recognisable. Hence in suspicious chest cases examination of the larynx becomes a necessity, and *vice versa*. The chest should be well explored on discovering the least grade of abductor paralysis.¹¹

(To be concluded.)

SOME NOTES ON THE MINERAL SPRINGS OF AUVERGNE.¹

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As the season has arrived when medical men are in the habit of suggesting for their patients additional therapeutic agents, in the shape of mineral waters, as a concomitant to change of air and scene, I thought a few notes on the many valuable springs of Auvergne, which I visited in the autumn of last year, would not be uninteresting to the Academy. Owing to the ease with which it can be reached from Paris by the Paris, Lyons, and Marseilles Railway, and the number and variety of the springs that exist in this volcanic district, Auvergne offers, in my opinion, one of the best localities on the Continent in which to choose a mineral water that will suit the therapeutic indications of most of the ordinary ailments physicians are called upon to treat. Situated in the midst of the most beautiful mountain scenery in France, and within easy reach of each other, these springs offer many attractions to the invalid, as well as to the daily increasing number of fashionable valetudinarians, who consider a course of mineral waters absolutely necessary in their annual existence. To one of the springs of this region—Royat, now so well known—I need not allude, as its character and therapeutic properties were so ably and graphically brought under notice by the late President of the College of Physicians, Dr. Cruise, in a paper read by him before the Academy of Medicine last year, that I could add nothing that he has not called attention to. There are other springs of this region to which it was his intention to allude in a future communication, and I trust he will not consider that it is in any spirit of anticipating him that the few remarks I have now to offer in connexion with them are made. The other springs to which I wish to allude are La Bourboule, Monte Dore, and Chatel Guyon.

La Bourboule.—This spring is now beginning to share with Royat an equal amount of popularity. The attention it is receiving at present from medical men in England, as a water particularly suited for the treatment of obstinate skin diseases, is calculated to make it ere long one of the most flourishing and fashionable, as it is at present one of the best, of the many springs of Southern France for such cases. Though for many years recommended by the Paris physicians for the value of its waters in such affections, it is only within the past seven or eight years, coincident with the growth of its increased accommodation, and the easier means of reaching it now by railway from Clermont—the capital of Auvergne,—that its value as a powerful arsenical spring has been recognised in these countries. The value of its waters is enhanced by its situation in the most mountainous part of Auvergne, being about 2600 feet above the sea level; and the invalids who now go there can reach it in thirteen hours from Paris. Laquelle, which is the railway station for both La Bourboule and Monte Dore, is distant only about five miles from either place, and comfortable omnibuses convey visitors from the station to both of these places on the arrival of trains. The Bourboule springs have

two sources, the source Perrière and the source Chaussy, both identical in chemical composition. The Perrière spring supplies 388 quarts per minute, at a temperature coming from the earth of 140°F.; and both springs, in addition to containing arsenic, with the chlorides and bicarbonates of the alkalis, contain large quantities of free carbonic acid, which renders them sparkling and limpid in appearance. The first chemical analysis made of the Bourboule waters in 1853 showed them as containing a large quantity of arsenic, a quantity equal to twenty-one drops of Fowler's solution in each quart of the water, the largest quantity contained in any mineral waters now known. Professor Berthelot, in giving his opinion of the origin of the arsenic in these springs, says: "The conclusion at which I have arrived is that the soluble arsenic contained in the Bourboule waters takes its origin from the interior of the earth; it is brought up in the waters through the fissures in the granite, and is not produced by their contact with disintegrated earth schistes and other materials situated above the granite. Soundings were also made through the granite formations of a depth of 250 ft. below the surface by M. Perrière, who found the pure arsenic waters at this depth. Nine-tenths of the solids contained in these waters are salts of soda, with ammonia, potash, and lithia, with lime, magnesia, alumina, and traces of iron; while the acids contained in them represent arsenious, hydrochloric, and carbonic. In 1856 M. Gonod discovered in the sediment of these waters the presence of iodine. Professor Gubler, when studying the composition of these waters, considered the salts contained in them corresponded to the salts found in the blood. They may be described as thermal, alkaline, arsenical, chlorinated bicarbonate, gaseous waters. Ten years ago La Bourboule was only a mountain village, with a few houses and one hotel; it is now a town of fine hotels (of which there are over fifty), with two parks, a theatre, and casino, and twelve or thirteen medical men, several of whom speak English. As indicating the rapid growth of the place, statistics show that in 1865 only 600 patients underwent the course of treatment, while in 1877 there were over 2800, and last year there were over 10,000 or 15,000 visitors. In 1875 the first respectable bathing establishment was built by a Frenchman, Dr. Chaussy, and a few years later, in 1879, a company purchased his interest in the place and built two other establishments, one of which, the Grand Etablissement, is capable of accommodating over 300 bathers at a time, and is completely fitted up with all modern improvements. The waters for drinking are brought into the central hall of this establishment, and all round are situated bath-rooms, and halls for inhalation of the waters in a state of steam, and apparatus for pulverising it for throat and laryngeal cases, with rooms for ascending and local douches and wet and dry massage. The latter form of treatment is carried out on the most approved principles by skilled masseurs, so that any physician desiring such a mode of treatment for his patients can have it carried out here in perfection. Dr. Chaussy left a record of the cases treated by him at the spring for a period of over twenty-nine years, and nine-tenths of these cases were scrofula, rheumatism, and gout, especially the cutaneous manifestations of these diseases; special mention was also made of their beneficial effects in cases of chronic rheumatic arthritis. The springs are also held in high repute for the treatment of intermittent fevers, chronic coryza, hay fever, nasal and pharyngeal catarrh, strumous or tubercular joints, bronchial catarrh, asthma, and emphysema. Judging from my own observation of the cases I saw there, skin diseases, especially psoriasis, eczema, and lichen, seemed the more numerous, with numbers of cases of naso-pharyngeal catarrh, for whom the waters in the form of nasal douche and spray seemed admirably suited. I also noticed numbers of cases of suppurating cervical glands. As showing the beneficial effects of these waters on cases of all kinds of skin diseases, the medical men from the other watering places are in the habit of sending them to Bourboule to be cured, and my friend Dr. Brandt told me that many cases of psoriasis and chronic eczema that were not cured at Royat rapidly got well by an after course of Bourboule. The waters have generally to be taken cautiously at first, beginning with half a glass three times a day, increased to a glass, and their high temperature and saline taste are rather agreeable to some. If taken in too large a quantity they cause colic and diarrhoea, but most patients (even atonic dyspeptics) bear them well, producing in them a feeling of warmth in the stomach, and

¹⁰ Berliner Klinische Wochenschrift, Nos. 46-49, 1883.

¹¹ This question has been well argued by Semon (loc. cit.) in his papers on Abductor Paralysis.

¹ Read before the Academy of Medicine, June 1st, 1887.

sharpening the appetite. The usual course of the baths and waters is twenty-one days, when saturation is supposed to be reached. As the altitude of Bourboule is high, the season does not begin until June, and it ends with September. The autumn months are generally considered the best, and medical men sending patients there should recommend a supply of warm clothing, as the evenings are often cold. The waters bear exportation well and keep a long time, and are, in my opinion, a most suitable form in which to administer arsenic, from the ease with which they can be assimilated by the most delicate stomachs. Either source will do, as they are both exported, and it is quite immaterial whether the brand indicates the source Perrière or Chaussy, as the waters are identical.

Monte Dore.—Monte Dore, which is four miles higher up in the same valley (the valley of the Dordogne River) than Bourboule, is reached in the same time from Paris. It occupies, however, a higher altitude than the latter, being about 4000 ft. above the sea level, and enjoys a cooler climate. Its waters are below those of La Bourboule in temperature, being 113° F. as they come from the earth. Like the Bourboule waters, they contain arsenic, but in smaller quantity and in combination with iron, which latter exists in the Bourboule water as the merest trace. They are therefore considered more tonic than the Bourboule waters, but are not, in my experience, so easily assimilated or drunk by the visitors in such quantity. The springs of Monte Dore were known to be three in number since the last century. They are now nine, and the united quantity of water they give is equal to that of Vichy. The Cæsar spring is the best known, and contains the largest quantity of free carbonic acid. The Raymond spring, which is the most ferruginous, is the one most generally drunk in conjunction with the Madeline, which contains much less iron. These three springs are the principal ones. The springs of Monte Dore are very ancient: they were known to the Romans, and the remains of their baths are still to be found in tolerable preservation where they were hewn out of the solid rock at the foot of which Monte Dore is built. The bathing establishment of Monte Dore consists of two parts: the establishment proper, and another building called the Vapour Establishment. In the first were found the remains of the Roman Picina, where the waters came hot from the foot of the mountain. In 1877 two new halls were added to the pavilion—built in 1856,—with thirty-six bathing closets, which originally contained only seven baths hollowed out of the rock. These new halls contain from fifty to sixty bath rooms, with a Picina or bathing place, one of which is reserved for the poor gratis. The vapour establishment is, however, the great feature of Monte Dore. It was opened in 1852. On the ground floor are two galleries upon which sixteen vapour-douching closets open, eight on each side; between these two galleries are two pulverising halls, one on either side for each sex, for the treatment of affections of the throat and naso-pharynx. Each inhaling hall gives access to another smaller room where patients can breathe a less thick and hot vapour. Each patient before entering these halls is provided with a suitable waterproof dress worn over their ordinary clothing. A hundred patients at least can be accommodated in each inhalation hall. In 1877 the number of these inhalation halls was increased. The objects of inhaling the waters in a state of steam is to promote the absorption of their chemical constituents into the blood through the bronchial mucous membrane, and to medicate the bronchiæ and lungs locally should they be diseased. That the waters have a sedative action on the bronchial mucous membrane administered in this form we cannot deny, and the doctors of Monte Dore ascribe it to the carbonic acid present in the waters. They illustrate the sedative and anæsthetic action of carbonic acid applied locally by getting patients with neuralgia of the face to hold the painful part over a tube placed over one of the springs as this gas escapes from it coming from the earth, and into which it is received, and they find after a few minutes complete relief from pain, while considerable anæsthesia of the parts is produced. They also use what is called a carbonic acid bath to relieve neuralgia or gouty pains occurring in the joints or muscles. Monte Dore enjoys a high reputation for the treatment of asthma, both of the spasmodic and bronchial kinds, and judging from its sedative action on the bronchial mucous membrane when applied in the form of steam inhalations, its good effects in the latter form are undoubted. In the spasmodic form of the disease, which we now know is so often dependent on the presence

of poisons in the blood, derived either from ptomaines or the unoxidised products of urea circulating in the blood, my own impression of the efficacy of the waters in this affection is that they play a very doubtful part in the cure, which is, I think, more due to the bracing mountain air and the better oxidation of the blood and better assimilation of food which takes place in such a high altitude. Dyspepsia on any diet in such an altitude is consequently unknown, and quickly disappears after a short stay in Monte Dore. The Monte Dore doctors speak in glowing terms of the curative effects of the waters, when inhaled in the form of steam vapours, on ulcerating tubercular cavities in the lungs. My own impression is that change of air and the high altitude have more to do with any beneficial effects that are the outcome of their use than anything contained in the waters themselves. There is one feature in the manner of using these steam vapours which, judging from the recent light thrown on the pathology of phthisis, is certainly to be condemned—namely, crowding a number of cases of lung affections into a close moist atmosphere. We know such an atmosphere is just the very one in which the bacilli of phthisis is most at home, and there is every reason to suppose that mild or non-infected cases are likely to become the receptacles of the microbe, if they are not so already, by breathing such an infected atmosphere. I expressed such an opinion to one of the medical men there, and he agreed with me, and said the authorities of the place were taking steps to fit up separate inhalation rooms for each phthisical case, instead of having them, as at present, all crowded together. The medical men of Monte Dore do not consider the presence of hæmoptysis any contra-indication for the use of the waters, as they act, in their opinion, as astringents, both internally and topically; and they treat active hæmorrhage from the lungs by immersion of the feet in the rock-hewn baths where the water comes directly from the earth at its highest temperature, considering the revulsive action thus produced acts like the application of a Junod's boot. Besides cases of phthisis, most of those I saw at Monte Dore were cases of bronchitic asthma, emphysema, laryngeal affections, including tubercular ulceration of the larynx, laryngopharyngitis (clergyman's sore throat), rheumatism, uterine affections, palpebral conjunctivitis, and also chlorosis. The place enjoys a great reputation amongst singers for its effects on all laryngeal troubles, and, judging by the numbers who come there, they must derive benefit from it. The season at Monte Dore begins late (end of June), and is generally over by the beginning of September. The hotels are numerous and good, but the village itself is a dirty and an uninteresting one.

Chatel Guyon.—The third spa which I have mentioned, Chatel Guyon, is situated in a charming and picturesque valley of Auvergne, about six miles by road from Royat. Riom would be its railway station coming from Paris. Chatel Guyon is called by the French physicians the Kissingen of France, and its springs are very numerous, bubbling up in all directions over the place. Unlike Kissingen, its waters are hot, and not nearly so bitter or disagreeable to the taste. The amount of carbonic acid contained in the waters, and which escapes from the earth in every direction, makes the ground (especially in the large bathing establishment) quite hot under the feet. Their taste is slightly salt and acidulated, leaving a styptic after-taste. If drunk at the spring the saline taste is masked by the carbonic acid present, but if allowed to stand for some time the gas escapes and the saline taste reappears. The waters as analysed by Dr. Magnier, of the laboratory of the Paris School of Medicine, shows them as containing a large quantity of chloride of magnesium—thirty grains to the quart,—to which their aperient action is due. They possess also very considerable diuretic properties. This analysis also shows them as containing, besides the chloride of magnesium, chloride of sodium, and bicarbonates of lime, soda, potash, and iron. When kept in a closed vessel these waters deposit their iron, with a small quantity of carbonate of lime and magnesia. For this reason the waters do not look well when exported if kept for any length of time. After taking a few glasses of these waters hot from the spring, there is a feeling of intestinal gurgling, followed by an abundant bilious discharge, with either copious diuresis or a free action of the skin. Although the peristaltic action of the bowels is rapid, it is neither preceded nor accompanied by griping or pain. The stomach feels no inconvenience from the use of these waters, except in cases where the drinkers take too large quantities at short

intervals. In some cases of obstinate constipation the laxative effect is not produced the first day, but when it is once produced it continues uninterruptedly without pain or inconvenience. The internal effect of these waters is considerably assisted by the action of the baths, which, from the large quantity of carbonic acid gas present in them, has a most exhilarating effect on the bather, producing a feeling of what the French call "*bien-être*," which none but an atonic dyspeptic can sufficiently appreciate. Owing to this effect, when used as baths, and taken internally, the waters are largely availed of by dyspeptics, and for many such cases these waters are superior to Royat, the waters of which, as is known, have no aperient action. The cases that seemed to me to frequent Chatel Guyon were those of obstinate constipation, and the medical men of the place speak in high terms of their effects in such cases, and that when once the habit of a daily evacuation is produced by their use the good effects continue after leaving the spring. I also noticed a number of people who came there to get cured of obesity, for the treatment of which the waters enjoy a considerable reputation; and Professor Gubler considers them especially useful in cases of Bright's disease and diabetes. The waters also occupy a high position in the opinion of gynaecologists as a remedy in endometritis, uterine catarrh, leucorrhœa, and dysmenorrhœa.

In concluding these remarks, I have only to add that those who visit Auvergne either for health, recreation, or amusement, will not come away disappointed. And the invalid who cannot find among its many mineral springs one to suit his particular ailment is not likely to find it elsewhere, but he cannot fail, at all events, to come away much impressed by its splendid scenery and improved by its bracing mountain air.

Dublin.

CASE OF EPITHELIOMA OF THE TONGUE; REMOVAL OF LEFT HALF.

REMARKS ON THE OPERATION AND AFTER-TREATMENT.

By LOCKHART STEPHENS.

MRS. H—, aged forty-two, first came under observation on Feb. 17th of this year for an ulcer on the left border of her tongue of five and a half months' duration, caused by a sharp point on the first lower molar of the left side. There was no history of malignant disease in the family or of syphilis in herself. The ulcer occupied the middle third of the left border of the tongue, extending slightly on to the dorsum, but more on to the under surface, and its character was that of epithelioma. No glandular enlargement. The rest of the tongue looked healthy. Early removal of the left half of the tongue was strongly advised. For a week before operation the mouth was well washed out six or eight times daily, and especially after taking food, with a saturated solution of boracic acid. On March 1st, chloroform being administered through the mouth by Mr. Palmer Stephens, laryngotomy was performed, and a silver tube tied in, through which the anæsthetic was then administered till the end of the operation. Assisted by Mr. Rory Fletcher, I proceeded to remove the left half of the tongue. The back of the pharynx was well plugged with two pads of sublimated wood-wool wadding, and the mouth well washed out with the boracic acid solution. Nearly the whole of the left half of the tongue was removed according to Mr. Whitehead's directions, with this exception, that instead of scissors a stout blunt director was used to tear through the muscles down to the lingual artery, which was ligatured before being divided. Except a few small vessels, which were readily stopped under sponge pressure, there was no bleeding beyond a general slight oozing. The mouth was again washed out with the boracic acid solution, and the pads removed from the pharynx. Although the anterior parts of the pads were saturated with blood, the posterior parts were quite clean, showing that no blood had passed through or by them. The cut surface of the tongue was painted over with iodoform suspended in ether, whereby a uniform even coating of the powder was deposited. The laryngotomy tube was now removed, and the wound sealed with iodoform collodion. A small wood-wool pad was placed in the floor of the mouth, a strip of iodoform

gauze laid over the teeth, and the mouth completely covered with an antiseptic pad made of sublimated wood-wool wadding in iodoform gauze. During the day, after the operation, some eight or ten of these pads were required, as all saliva and discharge passed into them before coming into contact with the air of the room. For the first four days the treatment consisted in the patient washing out her mouth three times daily with the boracic acid solution, iodoform being applied on each occasion. All nutriment was administered per rectum by means of enemata prepared with the extractum pancreatis and zymonised suppositories, which were given every four hours. The temperature never rose above normal, nor was there at any time the least odour to the mouth beyond that of the iodoform. On March 5th the patient drank half a pint of warm peptonised milk three times during the day in addition to the feeding per rectum, which was continued until the 11th, the diet consisting of milk, ox-tail soup, jellies, and beef-tea, all of which were peptonised. On the 11th she was able to go for a drive, and was gaining flesh. On the 17th the tongue had almost healed, and was feeling soft and natural. No glands could be felt. The patient was ordered to do very little talking for the next six weeks, and at most for only a few minutes at a time: to eat no solid food which would be likely to irritate mechanically, and to avoid hot and pungent articles of diet; also to take extract of malt with peptones three times daily after meals. On April 23rd it was noted that she had gained weight and strength since taking the malt.

Remarks.—That there is still much difference of opinion in the minds of surgeons as to the best method of operation and after-treatment of cases of epithelioma of the tongue is, I think, obvious from the different accounts to be found from time to time in the medical press and literature. The success of operators in Germany is in advance of those in our own country, if I am rightly informed, and this seems to be due mainly to their more elaborate application of antiseptic principles in operations on the tongue and jaws. Having had the opportunity of watching cases of removal of the whole or part of the tongue by nearly all the methods practised in this country, I believe that removal with scissors through the mouth is in most cases the best, in that it admits of antiseptic measures throughout, both as to drainage of the mouth and keeping the discharge aseptic. For at least a week before any operation on the tongue the patient should be instructed to wash out the mouth frequently, and especially after taking food, whether solid or liquid, with some antiseptic lotion, such as a saturated solution of boracic acid. The offending tooth or teeth should be extracted some three or four days before operation, in order that there may be no unnecessary oozing of blood after the tongue is removed. In the place of sponges I used pads of sublimated wood-wool padding enclosed in iodoform gauze, of various sizes, such as are largely used in most German hospitals, and found them most satisfactory. These pads can be made of any size, and are admirably adapted for making firm pressure on a bleeding point; they absorb well, and are readily seized by any kind of forceps or sponge-holder, and as any number of them can be ready to hand no time need be taken up in washing, as in the case of ordinary operation sponges. At first sight it seems difficult to apply an antiseptic dressing to a tongue case, but the difficulty is, I think, more apparent than real. After painting the tongue with the iodoform ether, the application of which causes a little smarting, not amounting to pain, and leaves a good even film over the wound, I well covered the mouth with a wood-wool pad, and kept it in position by elastic loops over the ears. By this means all saliva passed through a layer of absorbent antiseptic material before coming into contact with the external air. A number of these pads should be prepared for use, and a fresh one applied on each occasion of washing out the mouth or on its becoming saturated.

Mortality after operation.—In Mr. Butlin's work on "Diseases of the Tongue," I find up to Oct. 16th, 1884, Mr. Whitehead had removed the *entire* tongue in fifty-eight cases, with nine deaths, of which five were due to septic pneumonia. Mr. Marrant Baker at the same date had operated in "forty cases, with four deaths, of which three were due to septicæmia or septic pneumonia." Mr. Butlin, in discussing the causes of death after operation, says: "Although hæmorrhage cannot be made directly responsible for many deaths, it exercises a very large indirect influence on the results of operations. The small quantity of blood which is lost is, in part at least, swallowed, and in part passes down into the trachea and bronchi. It is liable