head-tilting. Fixation with the paretic eye is very frequent—so frequent, indeed, as almost to acquire the value of a diagnostic sign. It may occur even when the other is the better-seeing eye. It is associated, of course, with marked secondary spastic deviation of the non-fixing eye. This necessarily separates the double images further from each other than if the unparalyzed eye were fixing and thus often renders the diplopia less confusing. Head-tilting is a very common symptom, especially in the vertical deviations; it being the readiest means of increasing or diminishing vertical diplopia. To tilt the head to the right depresses the right hand image whether that image belongs to the right eye or the left. Hence, in a right hyperphoria due to a paralysis, to approximate the images requires tilting the head to the left if the images are homonymous, and to the right if they are crossed. This shows why, in some cases of paralysis of the right superior rectus, the patient may tilt his head to the right and in other cases to the left. Anisometropia occurs often, but perhaps not oftener than in ordinary squint.

Dr. Duane classified the types of deviation that he has seen as follows: 1. Isolated paralysis or moderate paresis of the superior rectus. This is by far the most common form and one often overlooked, because the deviation in the primary position is usually slight. Two varieties occur: (a) Paralysis of one eye; fixation with the other eye. He has seen perhaps 9 or 10 cases. Head-tilting is frequent. Cases are often unrecognized except by careful examination. (b) Paralysis of one eye; fixation with paretic eye. These cases, of which he has seen 10 or 12, constitute a characteristic group. If the right eye is the one affected (as is usual) the patient keeps the head tilted markedly and turned to the right, and avoids looking to the right and up. When he does look to the right, and especially if he looks a little above the horizontal plane, the left eye shoots obliquely and sharply up and may at the same time diverge. Movements in other directions are usually normal. In infants the head-tilting may be so pronounced as to produce a special kind of false torticollis (this in three of Dr. Duane's cases). 2. Congenital ptosis. He has seen only one or two cases and these not bilateral—although Willbrand and Saenger say it is almost always so. Not to be confounded with true congenital ptosis are the not very infrequent cases in which the lid droops when the eyes are turned in and rises when they are turned out, or vice versa. 3. Paralysis of the external rectus. Of uncomplicated paralysis of this muscle he has seen only 4 or 5 examples. The most usual form of complicated paralysis is the well-defined syndrome marked by (a), deficiency partial or complete, of the externus; (b), marked insufficiency of the internus; (c), retraction movements, when the eye is adducted, there being combined with this a narrowing of the palpebral fissure and an upshoot or downshoot of the adducted eye. A large number of cases of this syndrome have been described. He has seen 8. Almost certainly it is due in all cases to structural abnormalities in the muscles themselves. 4. Paralysis of the internus apart from that occurring in the syndrome above mentioned he has never seen as a congenital affection. 5. Other congenital paralyses noted are those of the superior oblique (four cases, possibly more), inferior rectus and superior oblique (one case), inferior rectus alone (three, or perhaps five cases), inferior oblique (one case at least). 6. Spastic upward deviations secondary to paralysis of the superior rectus in the fellow eye or to paralysis of the externus in the same eye are common. In one case such deviation appeared to be due to primary overaction of the inferior oblique.

Dr. Duane agreed with Dr. Posey concerning treatment. Many patients require no treatment, as their symptoms do not warrant interference.

DR. W. C. POSEY, Philadelphia, said that he is fully aware that the study of many of the cases is not so complete as could be desired. But the observation of cases of this nature is often extremely difficult, and meager as the details may be, the results obtained by observing the eyes as they are made to move through the various meridians of rotation, and the deviations which occur behind the screen, are often the only means of diagnosing the nature of the palsy and of differentiating the affected muscle.

Of particular interest is the group of cases which were treated by tenotomy of the inferior oblique muscle. The procedure is a very simple one and is best done by making a curvilinear incision over the lower inner orbital rim as deep as the bone. A strabismus hook is then inserted into the soft tissues and passed in different directions until traction made with it rotates the eye up and somewhat out. This is evidence that the tendon of the muscle has been secured, and all the tissues on the hook should be freely divided by the scissors. The results are satisfactory, though no great degree of effect is obtained.

VOLTAIC TURBINAL PUNCTURE FOR THE RELIEF OF INTUMESCENT AND HYPERTROPHIC RHINITIS.

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Electrolytic action on certain substances is so well known and understood by the majority of physicians that the rehearsal in this paper seems unnecessary with the exception of a few vital points to refresh the memory. The galvanic current has two known properties, chemical and thermal, electrolysis being the result of the chemical action. A marked difference in the chemical action takes place at either pole during electrolysis. The anodal or positive pole when in contact with, or immersed in, a compound fluid attracts the oxygen and acids of the electrolyzed fluid or tissue; the negative, or cathodal, attracts the hydrogen and the salines.

This chemical action of the negative galvanic current, when in contact with or immersed into mucous membrane, produces decomposition and slight canterization; the thermal effect, if the current be intense enough, will cause redness, heat, congestion, inflammation, and even sloughing in turbinal-tissue. The sensory nerves are stimulated by the galvanic current. The gustatory nerve, stimulated by the positive pole, induces an acid-galvanic taste. The negative pole gives a metallic or coppery taste. The negative or cathodal pole has a slightly caustic action on the mucous membrane when applied a short time and with low amperage. When used at a higher amperage and for a longer time, destructive and degenerative action will result.

Experiments on tumors have demonstrated distinctly the above-mentioned properties, and the galvanic current has caused tumors to shrink, dissolve and be dissipated. However, when the positive current is used through the medium of a gold needle in the mucous membrane of a turbinated body it causes a dry coagulum to form, which adheres tenaciously to this electrode, and for this reason makes it difficult to withdraw, and will cause intense reaction on the mucous membrane. On the other hand, the cathodal or negative pole has quite a different effect. The liberation of gases at this pole produces a frothy soft coagulum, which makes it easy to extract the needle after piercing turbinal tissue.

The beneficent results of voltaic turbinal puncture by means of the negative pole for the relief of nasal stenosis due to pathologic changes, such as swelling, tumefaction, infiltration, new growth of tissue, are manifold. Chiefly they are as follows:

1. Pain during the treatment is practically *nil*.
2. The operation is almost bloodless.
3. Postoperative reaction is satisfactory.
4. No scar tissue remains on the surface of turbinate.
5. Mucous membrane after treatment performs its natural function.
6. No postoperative complications follow.

TECHNIC.

The patient is seated in front of the operator in an ordinary straight-backed specialist's chair. The nasal cavity is well cleansed, and, if desirable, but not absolutely necessary except in hypersensitive patients, a weak solution of cocain, say 4 per cent., may be sprayed into the nasal chamber requiring treatment.

A wrist band (Fig. 1) is applied when the unipolar method is employed, holding a sponge electrode to which is attached the positive wire leading to the galvanic apparatus. The negative wire leading from the galvanic plate or battery is attached to a specially constructed nasal electrode into which is secured a polished gold needle, of the thickness of an ordinary pin with sharp tapering point, and three inches in length. Under brilliant illumination the nasal orifice is held open by aid

Fig. 1.—Wrist band with electric connections and needles.

of a nasal speculum. The nasal electrode containing the needle is held between the thumb and first finger, and the point of the needle is made to pierce the anterior tip of the turbinal body requiring treatment.

The rheostat is now gradually turned in so as to obtain the desired amperage. At the point of the needle there will be seen a frothy deposit which shows the cauterizing electrolytic action at this pole, denoting the liberation of gases and decomposition of tissue substance. The point of the needle is to remain in this position for about fifteen seconds, and by gently and steadily pushing forward it is gradually passed into the turbinal body to the desired length. The distance to which the

Fig. 2.—Arrangement of needles for bipolar method.

needle is to be inserted varies according to the length of the turbinate. The needle having thus been inserted into the turbinal body to the desired distance, the current is allowed to pass through this terminal and the milliamperemeter should register a stated amperage of three milliamperes for three minutes, care being taken that as little movement of the needle as possible be made. Before the withdrawal of the needle the rheostat is turned down and off. The needle can then be withdrawn as easily as it was inserted.

At times this puncture hole made by the needle will bleed a trifle. This oozing or leakage is readily controlled by a little pressure with the aid of a cotton applicator. The turbinate should then be milked from its

posterior end anteriorly. Experience has proved that bleeding is easily controlled by slight pressure along the course of the puncture canal.

CASE 1.—History.—Mrs. G. P. consulted me Oct. 8, 1906, complaining that she was using too many handkerchiefs, seven or eight a day.

Examination.—On examination I found a typical case of extensive anemic turgescence of both inferior turbinates, which were lying on the floor of both nasal chambers. This was my first case of needle degeneration, and I was not yet familiar with the technic as regards application of current and poles.

Treatment.—I pierced the left inferior turbinate with a specially constructed copper needle, puncturing into the interior tip. The positive current was used with three milli-amperes and twenty volts, allowing the needle to remain imbedded in the turbinated body for one minute. When trying to withdraw it, it was found that it had become adherent. I then reversed the poles, using the negative current for one minute more, which loosened the needle sufficiently to be easily extracted. The patient returned the next day, with more nasal stenosis than she had experienced before. At this time I had secured gold needles, which were especially made for this treatment. I inserted one needle into the right inferior turbinate and applied the negative current direct, instead of changing the poles, as at the previous sitting. Two days later the patient returned, informed me that she had no reaction and that she was using only about four handkerchiefs a day. Subsequently I used the gold needle in both inferior turbinates once more to a depth of two inches, applying only the negative

Fig. 3.—Outfit for voltaic turbinal puncture in case.

current. Thereafter the turgescence was sufficiently shrunk and the exudation had completely subsided.

CASE 2.—History.—Mr. F. A. C. consulted me Oct. 19, 1906. The ordinary symptoms of frontal sinus disease were present, such as accompany non-infected frontal sinus diseases. He had an acute non-suppurative frontal sinus involvement. Frontal sinus drainage was very much impaired, due to the distension of the anterior hypertrophy of the middle turbinates with serum. Turgescence was so marked that the nasal cavity in this locality was entirely closed, causing the middle turbinates, especially anteriorly, to press against the mucous surfaces of the septum. The septum in this case was surprisingly straight. The pain experienced by the patient was intense, coming in cycles which lasted from six to eight hours each time.

Treatment.—Being positive at the time that there was no purulent accumulation in this accessory sinus, and that, in all probability, an operation could be averted if proper drainage was established, I proceeded in exactly the same manner as though I were dealing with inferior turbinate turgescence. On account of the extensive tumefaction of the middle turbinates, I was justified in making three punctures in each of these turbinates at the first sitting, introducing the needle into the turgescence to a distance of one and one-fourth inches and allowing it to remain in place for two minutes at each puncture. The next day the patient informed me that his pain

had subsided, only a sensation of soreness remaining, accompanied by profuse discharge. I found that the two turbinates treated the day before had diminished one-half in size, and the frontal sinus was draining its serous contents into the nasal chamber. I advised the patient to continue an alkali spray solution before prescribed. On the following day I passed the needle once in each middle turbinate, the punctures being made a little more posteriorly to the ones of the previous sitting. I did not hear from him until one week after. On his return he informed me that his nose had not bothered him at all; the pain had subsided as well as the discharge.

CASE 3.—Mrs. E. M., seen Nov. 4, 1906.

Examination.—On examination it appeared that the patient had hypertrophic rhinitis of both inferior turbinates. After carefully palpating with probe and applying a weak cocaine solution, I was inclined to place the condition under the head of beginning hyperplastic rhinitis, on account of the peculiar consistency and the insufficient shrinkage under cocaine. Considered from a pathologic standpoint, it would appear that no great benefit could be obtained or a marked degree of shrinkage produced by means of voltaic turbinal puncture. However, as my results on true hypertrophy had, up to the present, been so satisfactory, a trial was advisable, because the hyperplasia seemed to be limited to the perichondrium and the adjacent tissue and because there was enough turgescence over the periphery which, if properly treated by electric decomposition, would be materially benefited.

Treatment.—These deductions were well founded, for, after four introductions of the needle into the inferior turbinates, the mucous surface was sufficiently drawn so that nasal breathing was all that could be desired.

CASE 4.—*History.*—Mr. W. J. consulted me in December, 1906, complaining of ear noises, some stuffiness and fulness of the ears, with slight impairment of hearing.

Examination.—Examination of his pharynx and nose revealed the mucous membrane to be in a state of chronic hypertrophy and edematous, which would account for the closure of the pharyngeal mouth of the Eustachian tubes, giving the ear symptoms cited. Both inferior turbinates were tumefied and soggy.

Treatment.—The gold needle was applied; two punctures were made in the right inferior turbinate and one puncture in the left inferior turbinate at two sittings two days apart. Result: Complete shrinkage of turbinates and cessation of ear symptoms. After the second treatment the patient inquired why treatment of the nose should help his ears. This is explained by the fact that both turbinates were now practically normal, and the swollen condition had not only been reduced in the nose, but in the pharynx as well. On request, he reported one month after treatment and at that time the condition was seen to be permanent.

CASE 5.—*History.*—Mr. J. M. H. consulted me in January, 1907, for stoppage of the nostrils, especially at night, and frequent attacks of cold in the head. At the time of examination the patient was afflicted with one of these colds.

Examination.—Inspection disclosed a large basal spur, which was in contact on the left side with a true tumefied inferior turbinate. The middle turbinate on the right side was soggy and serum laden. The inferior in the right side had previously been operated.

Treatment.—The needle was used on both these turbinates. Three treatments were necessary to shrink the left inferior and one treatment for the right middle. The patient, on his return eight weeks later, reported that he not only breathed better, but slept in comfort and had since had no attack of coryza.

CASE 6.—*History.*—Mr. R., February 3, emergency case, came for nosebleed, which had existed off and on during the previous forty-eight hours, but not profusely. He had been suffering with neuralgia over the right eye for the last eight months.

Examination.—On examining his nares, after thoroughly ridding the nasal cavity on that side of a clot of blood, a small ulceration was seen on the septum on the right side, due, in all probability, to the rubbing of the partially hyperplastic in-

ferior turbinate against it. The bleeding was easily controlled and the patient asked to return the next day.

Treatment.—The gold needle was inserted. Two punctures made on the right inferior turbinate, in the regular manner, and it was noticed at this sitting that he also had extensive involvement of the middle turbinate on this side. Two days later this middle turbinate was punctured once, which shrunk it to its normal size. The patient returned ten days later for the express purpose of informing me that he had not had neuralgia since the voltaic puncture treatments; that the condition of his nose was now normal.

CASE 7.—*History.*—G., a boy of 16. On Feb. 4, 1907, the mother of the patient consulted me regarding excessive snoring of her son.

Examination.—This showed absence of adenoids and tonsils, but practically occluded nasal chambers, due to true hypertrophy of both inferior turbinates of infiltrated variety; they were exceptionally large and soggy for a boy of his age.

Treatment.—Both inferior turbinates were punctured three times, once at each sitting. Shrinkage was very apparent at each subsequent call, practically establishing normal breathing. His nose would have been absolutely normal but for the sigmoid-deflected septum. This septal deformity it was not deemed advisable to remove for the reason that the patient's symptoms had subsided, breathing through the nose being good, and his mouth was now closed at night.

CASE 8.—*History.*—Mrs. C. J., seen Feb. 10, 1906, had contracted a cold three days previous to my visit to the house. Suffering at the time with an obstruction of the Eustachian tube due to the nasopharyngeal inflammation, which caused a sensation of fullness in both ears. The reason for my call was to relieve her of an acute non-suppurative frontal sinus, which was the cause of rather sharp neuralgic pain.

Examination.—I found the nose markedly congested, the hyperemia showing all the effects of an aggravated case of acute rhinitis. Nasal breathing was impossible, due to the extensive hyperemia and turgescence of the turbinate bodies, and a depletion of the capillaries in these congested nostrils by the use of adrenalin and cocaine was necessary. After the shrinkage of the turbinates it was possible to view the nasal chamber more thoroughly, and it was observed that the frontal sinus poured forth its contents freely, bathing the middle turbinates with a straw-colored serum. I prescribed a spray which should continue the shrinkage in order to drain the frontal sinus sufficiently, until she was able to come to the office for further treatment.

Treatment.—Two days later the pain had but slightly diminished, when I applied the voltaic turbinal puncture. After two treatments with the gold needle in both middle and inferior turbinates on both sides, the relief was surprising, and has remained permanent to this date.

CASE 9.—*History.*—Mrs. S. B. L. consulted me March 2, 1907, for the accumulation of crusts in the nose.

Examination.—On examination I found the inferior turbinate hyperplastic anemic, dry and scaly, and lying on the floor of the left nasal cavity. An excision of the middle turbinate had been made three months previously. The inferior turbinate was not of the ordinary variety, being more fibrous than the average, probably due to the use of some cauterizing agent. I suggested removal by the ordinary method of excision.

Treatment.—The patient, not wishing to consent to operative work with knife, saw, scissors or punch, as a last resort, and not in the least anticipating much benefit, I applied the voltaic turbinal puncture. On her return the next day I noticed little or no effect. I repeated the same puncture treatment every day for seven days. Although the contraction of this fibrous body was not so satisfactory to ocular inspection as the ordinary and true cases of turgescence hypertrophic rhinitis, the crust formation was relieved.

CASE 10.—*History.*—Mr. J. P. G., seen March 15, 1907. Nasal obstruction on the left side. He had been treated for nasal lesions from time to time.

Examination.—A large synechia was visible by anterior rhinoscopy. This band spread across from the inferior turbinate,

adhering to the septum on the left side, which in all probability was caused by some previous operative interference. The advisability of removing the synechia was apparent, because it obstructed the floor of the nose to such an extent as to interfere with the floor drainage. This was done with appropriate dressing. Besides this synechia, he had a very large hypertrophy of the middle turbinate, more especially marked posteriorly, which hung down, resting on the synechia before its separation. I introduced the gold needle into this hypertrophic body twice at one sitting. This treatment was sufficient to shrink the turbinate to such an extent that his nasal breathing was completely established on that side.

Special Article

TRAVEL NOTES FROM SOUTH AMERICA.

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CHICAGO.

(Continued from page 1361.)

V. *MEDICAL AFFAIRS IN ARGENTINA.

The medical profession is well represented in Argentina. It is made up of men who stand high in the community, and who, besides attending with zeal to their legitimate work, take an active part in social and political affairs. Buenos Aires, the capital of the republic, has no lack of medical talent. With a population of about 1,000,000, it has no less than 1,500 practitioners of medicine, among them 40 from England, 2 from Switzerland and 6 or 7 from Germany, but only 1 from the United States, Dr. Palmer K. Lyon, of New York, medical director of the New York Life Insurance Company for South America, who does not practice.

As in Brazil, the social status of physicians in Argentina is high, and many young men study medicine without any intention of entering practice, simply for the purpose of preparing an easy way to social recognition and distinction. The title is also of much value in the matrimonial market. The doctors are scattered all over the city, but most of them keep an office in the central part of the city. The physicians who have a large practice assign the most disagreeable part of it, the collection of fees, to the porter. This important individual is supposed to exercise good judgment in collecting the fee in advance, which, as a rule, varies between \$5 and \$15. When the money matter has been attended to, the patient receives a card, and when his turn comes enters the sanctum of the doctor. The one-man office is holding its own in this city. Some of the busy practitioners have an assistant, but the physician makes his own diagnosis. Office laboratories, suites of rooms containing electric machinery, Roentgen apparatus, medicated sprays, microscopes and test tubes operated and used by a corps of low-salaried assistants, and much other display to excite the awe and confidence of the public, but really intended to command a large fee, have so far not found their way into this country. If a chemical or microscopic examination becomes a real necessity the patient is sent to a pharmacy for this purpose and later returns to the physician with the report.

Medical and surgical services are paid for on a scale which compares well with our own. Fancy fees are few and far between. One of the surgeons whom I met had a fee of \$4,000

in prospect for an operation he performed recently on a young woman the subject of an echinococcus cyst and abscess of the liver, the abscess being etiologically distinct from the cyst. Dr. John O'Connor of the British Hospital (Fig. 16) is the ablest and best known English surgeon in the city. He has lived in Buenos Aires for eighteen years, and besides his onerous hospital work has a large and remunerative private practice. Many of the more prominent doctors display no signs, making use of modest glass plates, on which their names and titles are engraved and in some instances their specialties; but flaming signs of any kind are not to be seen anywhere. The offices which I visited looked more like well-furnished parlors than consultation rooms, presenting a pleasing home-like appearance. Political influence weighs heavily in the balance of a successful professional career, much more so than in our country. Influential and wealthy relatives and friends are also valuable promoters. Medical cliques are numerous and of a hard-shelled kind.

Speaking disparagingly of colleagues when they are out of hearing distance is a common flaw. The tie of fraternal union is loosely woven and very elastic. Overcrowding of the profession is undoubtedly responsible for a lack of better cordiality among the medical men. The law regulating the admission to practice of students in medicine from foreign countries is a very stringent one, and, I was informed, is directed especially against Italy. The Italian population of Argentina is very large, and we know from experience in our country that the Italian doctors follow their countrymen wherever they go in any considerable number, and if it were not for some such safeguard the country would be flooded with graduates from the many medical schools of Italy.

If a foreigner intends to practice medicine in Argentina he must pass a series of twenty-three examinations in the Spanish language after his foreign diploma has been approved by the minister of the interior or secretary of state of the country in which he resides, and after it has been

Fig. 16.—British Hospital, Buenos Aires.

transmitted through state channels to the minister of education of Argentina. The examinations are oral and are conducted by the faculty of the medical department of the university. The fee for these examinations must be paid in advance and amounts to 900 pesos (\$378). Three professors are present at each examination. The great trouble has been to get these three examiners together at any fixed time. A German physician who has passed the examinations told me that many a time he had made his appearance at the appointed time, but failed to find the board in session or perhaps only one or two members present, and consequently one examination was postponed for weeks, and the same *mañana* policy was repeated with the other examinations, so that it took several months before he could pass them all. He said the examinations when they did take place were fairly conducted and complained only of the length of time it required to pass them all.

It is related on good authority that one foreigner who was undergoing this tedious ordeal, after calling at the place for examinations several times, finally found two members of the commission present. Locking them up in a room, he went out to hunt for the third member and, when he returned with him, found to his astonishment that one of his prisoners had made his escape through a window. From what I saw and heard in Buenos Aires, I think a good American surgeon with a knowledge of the Spanish language would soon build up a large and remunerative practice, although among general practitioners the desire to operate is as strong here as in other countries where surgery is overshadowing medicine.

* This series of articles was commenced September 14.