when the only obtainable record was by months.

SUMMARY.

Recognition by clinical signs and by cultures of carriers is the dominant problem in the control of scarlet fever; the isolation and treatment of the carriers bears the same relation to the control of the disease as the diphtheria carrier does to the control of diphtheria.

TREATMENT OF "ESSENTIAL" FACIAL NEURALGIA BY LOCAL ALCOHOLISATION.*

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THE treatment of trifacial, the so-called "essential" neuralgia, by "local neurolysis," has stood the test of experience. The destruction of branches of the nerve by means of chemical substances, more particularly alcohol, introduced directly *in situ*, remains the only really effectual treatment, taking the place of the old physiotherapeutic and surgical methods.

My object has been to act directly upon the nerves by means of substances that either destroy or fix the tissues, and the method has proved highly satisfactory in respect of pain. Of such agents I have tried osmic acid, the chromates, formolised glycerine, carbolised glycerine, alcoholised mentholated glycerine, chloroform, ether, antipyrine, salicylate of soda, and salts of quinine in various proportions and doses. None appeared altogether satisfactory; either it was injurious to the neighbouring tissues, or, if innocuous, it was inoperative. I have now adopted alcohol as the chemical agent of election, varying in strength from 70° to 95°, according to the age of the subject, the tonus of the skin, the healthy state of the eyelids, conjunctivae, nasal mucosae, and so on.

Anatomy of the Trifacial Nerve. The fifth pair of cranial nerves, the trifacial, comprises three principal trunks: the ophthalmic, the superior maxillary, and the inferior maxillary. The ophthalmic subdivides into three terminal branches, the superior maxillary into six, the more important of them being the superior dental and the infraorbital; the inferior maxillary splits up into seven branches, the two

most important being the inferior dental and the lingual. These various trunks of peripheral branches find their way through foramina, canals, and notches either at the base of the skull or through the facial bones. It is these which we have to reach for the purpose of local alcoholisation.

There are three stages of neurolysis: superficial, medium, and deep.

The superficial or anterior stage is represented by the ophthalmic nerve where it emerges through the supra-orbital hole or notch, by the infra-orbital and the mental branch. The medium stage comprises Spix's spine (origin of the inferior dental canal) and the posterior palatine canal.

The deep or posterior stage is made up of the sphenoidal fissure (ophthalmic nerve), the foramen rotundum (superior maxillary nerve), and the foramen ovale (inferior maxillary nerve).

Description. Local Anaesthesia.—The operative procedure has to be modified in certain details for each foramen or canal to be injected. It is absolutely necessary to be able to introduce the needle with precision in the midst of this bony facial architecture, which is naturally very irregular, and is, moreover, subject to individual variations. The only way to achieve this familiarity is to repeat the operation as frequently as possible on the cadaver. Here are a few general precepts for the living subject. As a general rule the patient should be lying down, the head inclined in the position most favorable to the injection; maintain under gauze any hair, moustache, or bristles that would interfere with one's freedom of action. Make use of tincture of iodine for local disinfection. It may be desirable in certain nervous subjects to induce general anaesthesia by the aid of ethyl chloride, but this leaves one a minimum of time to attain one's object, and one would have to be very sure of one's whereabouts in order to obviate the risk of a useless intervention.

In the vast majority of cases I obtain local anaesthesia with *novo* or *stovo-cocaine*, 1 per 100 (half a centigramme each of cocaine and *stovaine* per c.c.). The needle can be introduced with a minimum of pain if, after anaesthesia of the integument, it be pushed slowly into the depths of the tissues, anaesthetic in hand. In the course of some hundreds of injections I have never on any occasion wit-

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nessed anything of the nature of syncope, even after employing as much as 8 c.c. of the above solution sterilised at 100° C. for five minutes. I have abandoned the use of adrenalin, because it seemed to me to predispose the patient to the development of oedema, or even necrosis. With regard to the syringe and needles, I prefer an all-glass syringe and a platinum needle of small calibre from 3 to 6 centimeters in length.

Strength and Quality of Alcohol to be Injected.—The quantity of alcohol to be injected should not exceed 1.5 c.c. (a cubic centimetre and a half), and the strength varies from 70 to 95 per cent. For facial neuralgia involving the three branches, we can at one sitting inject the whole superficial ophthalmic and infra-orbital regions and the mental branch, and at a second sitting, three or four days later, inject the foramen rotundum and foramen ovale. If the patient has been in a hurry I have sometimes made the five injections, superficial and deep, at the same sitting. There is no fixed rule in this respect. The choice, the number, and the repetition of the injections is subject to this or that localisation or generalization of the pain, to the mildness or the severity of the consequent oedema, and so on.

The pain of the neurolysing injection can never be wholly prevented or overcome, but it can be reduced to a minimum by waiting four or five minutes after the deep injection of stovocaine before injecting the alcohol. The pain is comparatively less in the infraorbital canal and foramen rotundum; it is more severe in the foramen ovale, and still more so in the supra-orbital and mental foramina.

Accidents to be Avoided.—We must be careful not to inject the alcohol into a blood vessel, otherwise the precipitated matter of the blood would block a whole vascular region, and would expose us to the risk of inducing gangrenous necrosis of the particular area. I have seen cases in which the result has been necrosis of the palatine bone with elimination of bony sequestra. As a rule the sphacelus, limited to the cellulose-cutaneous tissues of the face, heals in the course of a few weeks, leaving a scar which is often very disfiguring. Consequently, should blood pass by the needle, it is preferable either to postpone making the injection of alcohol until another day, or only to inject the alcohol deeply with a constant to and fro movement of the needle.

I have also witnessed the production of ocular paralyses lasting from some weeks to several months, but invariably curable, after injections of the foramen rotundum, and even, curiously enough, after injection of the foramen ovale. The external oculo-motor nerve is almost invariably the one involved in either case.

To avoid ocular paralysis we must wait, after injecting the cocaine into the foramen rotundum or ovale, four or five minutes before making the alcohol injection. Should the anaesthetic fluid come into contact with the dangerous zone of the ocular nerves, there will be diplopia, in presence whereof the needle is withdrawn. Cocaine diplopia, however, is very ephemeral.

Facial paralysis, which is of rare occurrence, is due to an error of technique, a wrong direction having been given to the needle in passing through the foramen rotundum.

Facial erysipelas is of very rare occurrence, but may not be attributable to a lack of asepsis. The attack may be due merely to the awakening of streptococci lying dormant in the tissues.

Operative Sequelae.—The oedema and swelling of the tissue are immediate, and persist until the second day. The areas most liable to oedema are the infraorbital, and especially the supraorbital. The globe may be hidden by the palpebral infiltration, and we may even remark a certain degree of chemosis after the injection at one sitting of the supra and infra-orbital foramina. In spite of the tremendous swelling, however, there is no cause for anxiety, for everything clears up in a week or two. I merely direct the patient to wash the parts with tepid boiled water every two hours. It is unnecessary and even dangerous to bandage the eye. In two cases I have seen ulcerative keratitis supervene after dressings left *in situ* for 24 hours, due to the escape of a drop or two of carbolic glycerine from the foramen finding its way into the conjunctival cul-de-sac.

Conditions Indispensable to Success.—I. The intervention is limited to cases of true facial neuralgia of the so-called "essential" variety.

1. Whenever the pain in facial neuralgia persists continuously with no distinct intervals of relief it is not a case of "essential" neuralgia.

2. Cases of facial neuralgia which, not having been already treated surgically or by local

injections, are accompanied by cutaneous or mucous anaesthesia, are not cases of "essential" neuralgia.

3. When facial neuralgia, previous to any intervention, presents associated signs of stimulation or paralysis of other cranial nerves, such, for instance, as trismus, diplopia, facial paralysis, lingual hemiatrophy, etc., it is not a case of so-called "essential" facial neuralgia.

4. A case of facial neuralgia which, *ab initio*, involves the three branches of the trifacial, is not a case of "essential" facial neuralgia.

In these cases we are dealing with secondary facial neuralgia of either exo- or endocranial origin, *e.g.*, syphilis, tuberculosis, cancer, abscess, sinusitis, etc. In these the injection of alcohol, far from affording relief, may, on the contrary, aggravate matters. Nor is it of service in neuralgia following herpes zoster of the trifacial, for this is not a peripheral lesion.

II. We must make sure of reaching the nerve branches responsible for the pain. Cutaneous or mucous anaesthesia of the area innervated by the injected nerve is the only evidence we can have of a successful injection. This should supervene directly after the injection, and is accompanied by a sensation of induration and swelling, in reality non-existent. These disturbances of sensation are very varied and peculiar.

Short of permanent anaesthesia, the period of quiescence lasts from a few days to several weeks. The deeper, the more intense and total it be, the more protracted the relief. The anaesthesia lasts, as a rule, three or four months. Tactile sensation is the first to return, then the sensation of heat, and, finally, pain.

Two or three days after the injection, the patient is apt to get a little itching in the anaesthetised area of the "pins and needle" type. This surprises the patient, who finds himself scratching an insensitive area of skin.

Results.—The results are really remarkable in all cases of true "essential" facial neuralgia. Success is certain when the alcohol has really destroyed the branches or nerve trunks responsible for the pain. Out of several hundred patients thus treated I remember only two, in which, after perfect regional anaesthesia, the pain persisted. One of these patients has

since been operated upon surgically, but still without success. The more familiar we become with the method the greater is the measure of success that follows our intervention; in fact, the only possible cause of failure is the inability of the operator to reach the nerve trunk with his needle. In such case it is not the method but the operator that is at fault.

It must be admitted that in certain, happily rare, subjects the introduction of the needle into the round and oval foramina is a matter of considerable difficulty, because these orifices may be masked by osseous abnormalities, and several successive injections may be required to attain the object in view. Then, too, in elderly subjects, I have sometimes found the walls of the superior maxilla so fragile that one could not make sure of getting the needle into the infraorbital canal.

Relapse.—The cure, after a properly made injection, may be final. My statistics comprise 22 patients who remained cured for from ten to fourteen years. As a general rule, however, relapses occur in a year or eighteen months. The relapse is sometimes less severe than the primary condition, or it may bring with it the same paroxysmal phenomena. However this may be, they are amenable to the same operation, and the subsequent cure will probably be of somewhat longer duration. After the fifth or sixth injection it is rare for the cure not to be definite.

Conclusions. Every case of so-called "essential" facial neuralgia that does not rapidly yield to antineuralgic medication or the usual measures is to be treated by the method of local alcoholisation. Surgery has lost its hold on these cases; it is ineffectual, often mutilating and disfiguring; moreover, it has no longer any *raison d'être*.

Clinical Department.

ULTRA-VIOLET LIGHT A SYMPTOMATIC CURE FOR ECZEMA.

BY JOHN BRYANT, M.D., BOSTON.

ITCHING and eczema are usually considered to be somewhat synonymous. If one cannot eliminate the eczema, to eliminate the itching is at least to add greatly to the comfort of the patient. It has, therefore, seemed worth while to record the almost instantaneous relief from this distressing symptom which has been ob-