Discussion

The important fact to be noticed is that in two of these cases the prognosis was considered hopeless, in the third it was grave in virtue of the insidious development in a young man of schizoid signs, and in the fourth the psychoneurotic signs were present to a degree which paralysed productive activities and acted as an insuperable bar to ordinary pleasures. The absence of specifics for mental disorder is an accepted and lamented fact. In the cases above mentioned conditions of undoubted gravity have been remedied. The method has the advantage of a physiological justification lacking in more dramatic methods of treatment. Therapy with sex hormones is a rational procedure in post-climacteric conditions such as Case I and in schizoid states such as Cases II and III. Its mode of operation where the picture is tinted largely with psychoneurosis, as in Cases II and IV, is less readily understandable. I believe that the form of psychoneurotic symptoms is largely determined by the degree of stability shown by the vegetative nervous system, and this, in its turn, is dependent on glandular activity. On these grounds one obtains at least a hint of how these therapeutic agents act in the amelioration of psychoneurotic symptoms. It does seem possible, however, that sex hormones of the potency used in the treatment of these cases have a general dynamic action in producing a more healthy affective tone in psychological disorders of divergent types.

In all these cases except Case II I am satisfied that to the sex gland extracts alone could the remarkable improvement be ascribed. In Case II psychotherapy was definitely of value, but the remarkable speed and extent of the improvement were due to the hormone therapy.

Glandular therapy, largely on the shot-gun basis, with a preliminary barrage of faith, has been known to the profession for a decade as a line of treatment in mental disease. I myself have experimented before with glandular extracts of the most diverse nature, alike only in the extravagance of the claims made for them and in their uniform uselessness. I am quite convinced that the pure hormone products used in these cases are of a potency and usefulness such as I have not encountered before in the treatment of psychiatric conditions by the older gland extracts. It may well be that in this direction lies a future hope in the treatment of psychotic conditions.

BIBLIOGRAPHY

- Arndt, Heinz (1939). *Wien. med. Wschr.*, **89**, 222.
Weiss, O. L. (1939). *Dtsch. med. Wschr.*, **65**, 261.

As is common knowledge, the strain of war conditions is playing much havoc among people suffering from nervous and mental illness. To assist them the Mental After Care Association is having to expend money far in excess of its previous experience, because a special function of this organization is to give practical help to the incipient mental patient. War weariness and unemployment tend to affect a large number of men and women who, but for the extra tax put upon their nervous systems, would not break down, and those are increasing in number as time goes on. Last year the association dealt with over 4,000 patients, and in order that the work may be carried on to its full standard of efficiency in providing convalescence, work, tools, clothing, etc., to those in need, funds are urgently required, and the secretary, Miss E. D. Vickers, Room 354, Grand Buildings, Trafalgar Square, London, W.C.2, will gratefully receive any donations or give fuller particulars.

THE SURGICAL TREATMENT OF
TRIGEMINAL NEURALGIA*

BY

G. F. ROWBOTHAM, F.R.C.S.

Research Scholar, Neurosurgical Department, Manchester
Royal Infirmary; Neurosurgeon, Christie Hospital,
Manchester, and Salford Royal Hospital

Trigeminal neuralgia is one of the aristocrats of medicine; it has a noble inheritance extending far into the past; it knew Avicenna and was nurtured in the faces of monks and distinguished ladies, and now, in its maturity, it has chosen its trigeminal home in healthy stock irrespective of social or professional distinction. Tic douloureux connotes a clinical syndrome of severe spasmodic pains in the face and does not imply a precise pathology, although there are not wanting abundant suggestions as regards its actual parentage.

My remarks are not concerned with those pains which can be attributed to a demonstrable pathological lesion and which can often be cured by the removal of a septic tooth, drainage of a paranasal air sinus, or the enucleation of an acoustic neuroma. It is rare for neurosurgeons to be confronted with such easy problems: the cases have usually been previously sorted out; certainly many of these patients are edentulous.

Various Operative Procedures

Many drugs have been used which control the severity of the pain, but they are never curative. Even the opportunity to live under ideal conditions is of little avail, change to a more favourable climate being just as likely to make the pain worse as better. Surgery offers a cure, and it is a blessing that something can relieve these terrible pains. All kinds of operations have been used (see Figs. 1, 2, and 3): avulsion of or alcohol injection into the supra-orbital, infra-orbital, and inferior dental nerves; alcohol injections into the ganglion and into the trunks of the second and third divisions; intracranial neurectomy in trunks 2, 3, and 1 in this order of frequency; posterior root section in the middle and posterior fossae; and division of the trigeminal tract in the medulla oblongata. All these manœuvres have been used by me at one time or another. The surgical attack naturally has developed from without inwards, from something easy to something technically difficult in an attempt to procure precision of section and permanency of result and to avoid troublesome complications and unpleasant sequelae. Section or alcohol block of the nerve trunks in front of the ganglion usually gives temporary results lasting at most two years. Complete destruction of the ganglion by alcohol is permanent and the injection is a relatively simple manœuvre; its fractional or partial destruction by alcohol is extremely difficult, and to acquire the skill many years of practice are necessary. Root section, whether in the middle or the posterior fossa, has two great advantages: fractional or partial division of the nerve can be made with precision and the motor root can be conserved. Complete anaesthesia of the cornea exposes this membrane to the dangers of trophic ulceration, with resulting opacity, irrespective of the method of denervation employed. Fortunately, this serious complication never occurs when the nerve supply to the cornea is not severed, and this is why fractional root section with sparing of the ophthalmic fibres is so important an addition to the modern operative technique. Facial paralysis occurs in a variable

* Read to the Section of Surgery at the Annual Meeting of the British Medical Association, Aberdeen, 1939.

percentage of cases after the extradural approach through the middle fossa, even though the dural envelope has been separated by sharp dissection from the great superficial petrosal nerve as it lies on the petrous bone. It is a drag on the petrosal nerve which injures the facial nerve; but no permanent damage is done, and the facial weakness nearly always recovers. In the posterior fossa the occurrence of facial paralysis is not fortuitous, depending on chance anatomical variations. The facial nerve can be seen and set aside; paralysis, if it does occur, is permanent.

Trigeminal tractotomy has the advantage that the face is not left unpleasantly numb, because the fibres of pain and temperature are severed, most of the pathways of touch being spared. However, the operation is relatively dangerous: the section is not guided by completely trustworthy landmarks as it is in root section, and convalescence is far from smooth. It is an operation to be used on few and special occasions, its only definite indication

contraindications to the giving of a basal anaesthetic followed by gas-and-oxygen—and these are very few—then I believe root section is the better method. Certainly fractional root section should be done in those cases in which the pain is not in the ophthalmic fibres, because by this method the nerve supply to the cornea can be conserved and keratitis avoided.

Relative Merits of Methods of Approach

On the relative methods of the extradural approach through the middle fossa and the intradural approach through the posterior fossa many divergent opinions are held. Both are excellent operations. In my series the

FIG. 1.—Drawing by Miss Dorothy Davison showing the extradural exposure of the trigeminal nerve through the middle fossa. (See also above diagrams.)

being in cases of bilateral neuralgia when the first side has already been denervated and keratitis has supervened. In cancerous patients with pains in the cervical, glossopharyngeal, and trigeminal nerves it is a much more useful procedure, because by its means the necessary manipulations can be done in one relatively small operative field. The values of alcohol injection and posterior root section have for many years been discussed with some freedom. Controversy is likely to exist for a long time still, because the assessment of the two methods does not rest entirely on scientific data; it depends to a great extent on personal considerations—the natural skill of the operator, his mode of training, and his temperament. If there are no specific

FIG. 2.—Drawing by Miss Dorothy Davison showing the intradural exposure of the trigeminal nerve through the posterior fossa.

A = Motor root of fifth nerve. B = Petrosal vein. C = Acoustic nerve. D = Facial nerve.

FIG. 3.—Diagram showing the various sites of alcohol block and of nerve section (A, B, C, D, E, F) used in the treatment of tic douloureux.

former has been the method of choice because it gives a wider margin of safety and because a better orientation of the posterior root can be obtained. The slightest technical error in the posterior fossa is likely to lead to a fatality; fractional modality section is not possible because the nerve fibres as they near the pons varolii do not become arranged into the physiological groups of pain, temperature, and touch. The operation is a "fair weather" one: everything must run smoothly; and particularly the operator is dependent on efficient anaesthesia, because the slightest rise in tension in the posterior fossa will make the exposures of the nerve impossible or extremely dangerous.

Conclusion

The final results as regards the relief of pain are not controversial—they are excellent; and with a careful selection of cases at least 95 per cent. will be good. No elaborate measurements are necessary to gauge the nature of the results, which are obvious: the patient is happy, his expression changes, his mode of life becomes normal, and his relatives are satisfied—no mean factor in the assessment of post-operative results.

In the neurosurgical clinic of the Manchester Royal Infirmary 800 people have been treated with only two fatalities; I have done over a hundred major intracranial operations on the trigeminal nerve in non-cancerous patients, including six tractotomies, without a single operative death: these are the facts.

Summary

A survey is made of the various methods of surgical approach in the treatment of trigeminal neuralgia.

In assessing the relative values of alcohol injection and posterior root section it is submitted that the latter is the better method.

The merits of the extradural approach through the middle fossa and the intradural approach through the posterior fossa are compared.

The results of surgical treatment of 800 cases are given.

Clinical Memoranda

The Segmental Pain of Diaphragmatic Irritation

The following case of perforated pyloric ulcer is of particular interest as it illustrates the referred pain of diaphragmatic irritation produced by artificial means.

The patient, a man aged 46, returned home at 9.40 p.m., when he was suddenly seized with agonizing pain in the epigastrium and chest. He was said to have fainted with the pain. On recovering he drank a glass of hot water, which he immediately felt trickling down to the left side of his ribs, followed in a few seconds by an acute pain, first in the supraspinous region of the shoulder, then on top of the shoulder, and finally up the side of the neck behind the sterno-mastoid muscle. At operation a perforated duodenal ulcer was discovered and sutured. It seemed from the site of the ulcer that any irritation of the diaphragm would have been on the right side and not on the left. Convalescence was uneventful except for a complaint of pain under the left costal margin for two to three days after operation, but without rise of temperature or other untoward signs.

The interest of the case lies, first, in the production artificially of referred diaphragmatic pain on the left side from a perforated duodenal ulcer, and, secondly, in the sequence of the referred pain. Clinically it has been noted that there is a correspondence of nerve distribution over the diaphragm and the area of the acromio-clavicular region, so that irritation of the diaphragm medially is thought to refer to the top of the shoulder (Cope, 1932), but the sequence in this case would make one think that probably this is not so. Following the flow of irritating fluid from right to left it would seem that the medial portion of the diaphragm gave a referred pain to the supraspinous region (this is where the pain was first felt), that as the more lateral area was affected the pain was referred to the top of the shoulder, and that proceeding laterally towards the left border of the diaphragm the referred pain was felt up the neck in the posterior triangle.

Normally the phrenic nerve is made up of fibres chiefly from the fourth cervical nerve, and so it is thought that referred pains are transmitted through the cutaneous branches of that nerve, probably by the chief acromial branch, "which passes over or through the insertion of the trapezius muscle and over the outer third of the clavicle to the shoulder" (Cunningham, 1909). The pain up the neck might be explained by the fact that the phrenic nerve sometimes receives a twig from the third cervical nerve, and so pain might be referred by the cutaneous branches of the small occipital nerve, which is derived from the second and third cervical nerves.

Highgate, N.

W. LEES TEMPLETON, M.D.

REFERENCES

- Cope, Z. (1932). *Early Diagnosis of the Acute Abdomen*, 6th ed., p. 14, London.
Cunningham, D. J. (1909). *Anatomy*, 3rd ed., p. 619, London.

Use of Evipan in a Case of Loss of Memory

Cases of loss of memory are quite frequent and are often mentioned in the daily press. The symptom is usually a manifestation of a hysterical reaction, and there has commonly been something desperate in the history which it was essential for the patient's peace of mind that he should forget. Though these patients usually will remember their names and circumstances after twelve to twenty-four hours of rest, it may sometimes be of great advantage to make them remember sooner. Direct questioning is very rarely successful. A light evipan narcosis has been found to remove inhibitions and resistance, and the following case is cited as an example of how quickly the necessary data can be obtained by a simple method which is not widely known.

CASE HISTORY

An elderly woman was brought into hospital by ambulance. She was crying, and looked extremely exhausted. She had been found wandering in the streets and taken to the police station before removal to hospital. She was obviously in great distress, and it was pitiful to see her trying to remember her name and particulars. Her complete amnesia made further questions useless. On physical examination no abnormal signs were discovered. The patient's arm was prepared and a warm 10 per cent. solution of evipan was slowly injected intravenously. She was asked to count, and when her voice became indistinct she was questioned in a loud and firm voice. The analysis lasted for twenty minutes, and 6 c.cm. of evipan solution was used.

After considerable mental resistance had been overcome by repeated questioning she divulged her name, age, and address. Further questioning revealed that she had left her home in the afternoon to go shopping. After having made several purchases she continued walking until she was taken to the police station, ten miles from her home. She had been walking for five hours. Her home life was extremely unhappy. She had five children, whom she loved very much, but her husband was a drunkard and used to maltreat her. She refused divorce as she did not want to bring disgrace on her family. Two days before the present attack she found out that her husband had been unfaithful to her. This shock proved too much for her, and the subconscious desire for escape from this intolerable position resulted in the present fugue.

Her relatives were called and the exact position explained to them. One hour after the injection she woke up and wanted to know where she was. She was feeling very tired but otherwise quite well, and quickly regained her orientation. She recognized her children at once and was able to return home with them.

ERIC FRANKEL, M.B., B.S.,
Resident Medical Officer, Acton
Hospital.