TREATMENT OF NEURALGIA
WITH SPECIAL REFERENCE TO
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This subject has been selected as one in which I have long been interested, and regarding which I have had special opportunities of personal observation, and more particularly of its treatment by Methylacetanilide.

In the Treatment of Neuralgia, the point to be kept in view is how we can best relieve temporarily, and if possible permanently, the pain experienced. Neuralgia being such a frequent ailment, and the large number of drugs, &c., at our command for its alleviation being so large, the careful study of its treatment becomes one of great importance, and is well worthy of consideration, in order that we may arrive at a conclusion as to what is the best line of treatment to adopt in a particular case.

The primary object of our treatment is to obtain the relief of pain, but we must also try to aim at securing that method, whereby we can at the same time, if possible, remove the cause, as for example the treating of a diathesis.
For the sake of clearness of description, I have arranged a table of the various ways of treating neuralgia which I have observed, classifying the methods as follows:—

**PREVENTIVE.** Attention to General Health, Sleep, and good ventilation. Counter acting a diathesis. Dietetics. Avoidance of worry, cold, fatigue, dazzling lights, noise, &c.

**TONIC.** Iron, Arsenic, Quinine, Phosphorus, valerianate of Zinc. Climate.

**SALTS,** including antirheumatic and salicylates, Salicine, Salicylate of Soda, Antifebrine, Exalgine, Chlorate of Ammonium, Iodide of Potash, Antipyrine, Phenacetin, Chlorate of Potash.

**ANTIGOUTY.** Colchicum, Salicylic Acid, Purgative.

**ANTISPASMODIC.** Amyl Nitras, Hyoscyamus, Belladonna.

**ANTISYPHILITIC.** Iodide of Potash, Mercury.

**SEDATIVES.** Bromide of Potash, Bromide of Ammon.

**GENERAL ANAESTHETICS.** Opium, Morphia, Chloral, Chloroform, Chloralamide.

**LOCAL.** Blisters, Sinapisms, Liniments, Ice Bags, Solid Menthol, Iodine, Capsicum, Cautery.

**INSTRUMENTAL.** Section and Stretching Nerve.

HYPODERMIC MEDICATION. Cocaine, Morphia.

ELECTRIC. Continuous galvanic current.

I shall take up each of these separately and give examples of cases that I have had to deal with in connection with them.

PREVENTIVE TREATMENT.

(a). General Health should be attended to. For if a person gets below par, there is a great tendency to the occurrence of neuralgic attacks, especially in a neurotic constitution.

(b). Sleep must be sufficient, as the want of it lowers the system.

(c). Good Ventilation is important, so as to keep the blood properly oxygenated. This is illustrated by the case of a young woman who frequently after spending the evening in a small room containing several people, where the ventilation was very imperfect, had a neuralgic attack.

(d). Counter acting a Diathesis with the view
of preventing recurrent attacks.

(e). Dietetics. Some persons subject to Neuralgia keep freer from it, if they have butter, cream, fats, cod liver oil included in their dietry. Food should be liberal but plain. This was exemplified in the case of a young medical man who never had neuralgia in his supra orbital nerves, except when he ate freely of rich foods.

(f). Avoidance of (1) Worry is necessary, for example, over business matters. (2) Cold, such as draughts in passages, or in railway carriages or cold east winds. (3) Fatigue, as in persons nursing sick relatives, long days' shopping, or over work. (4) Dazzling Lights, such as occur at places of entertainment. (5) Noise. Some persons are liable to neuralgia after hearing hammering, machinery in motion, cheering, or even orchestral music.

T O N I C.

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(a). Iron is of much value in cases where anaemia or chlorosis are marked. A servant girl who was brought to me by her mistress suffering from cervico-brachial and occipital neuralgia, and who,
from change of situation, damp room, constipation, &c., had become "bloodless", got quite well under the use of an iron tonic with improved hygienic conditions.

(b). Arsenic may be used in similar cases, with or without Iron. It is of special value in periodic neuralgia where the attacks return regularly at intervals.

(c). Quinine - one of the oldest and best known drugs for neuralgia. It is a powerful tonic and as it possesses Antimalarial action it is specially useful in neuralgia of malarial origin. An old soldier who was under my care had contracted malaria some years previously while abroad. He had an enlarged spleen and frequent "ague fits". Under the use of Quinine he improved greatly, many attacks being warded off by its early administration, and the neuralgic pains became less frequent.

(d). Phosphorus. I have only given this drug in combination, as in Syr. Ferri Phosphatis & Quin. et Strychniae and in Ferri Phosphatis. These were useful in neuralgia from debility.

(e). Valerianate of Zinc is useful where there is neuralgia of ovary or uterus, in hysterical states
or where the two conditions are combined.

(f). Climate - useful as a tonic, when a person feels "down" and has frequent neuralgic attacks there is nothing better than change of air or a sea voyage. A young man who had been living in a badly drained house, and had been working very hard for a law examination suffered in this way. A voyage to India and back put him right.

ANTIRHEUMATIC.

(a). Salicylate of Soda, used where there are neuralgic pains of rheumatic origin. A private nurse who had been nursing a recently confined lady caught a chill at an open door, and next day was seized with severe darting pains over the entire head, which kept her from sleeping at night. She obtained relief when I put her well under the influence of Salicylate of Soda.

(b). Salicine is used in the same manner. A patient with influenza, aged 22, had an attack of a rheumatic nature with persistent neuralgic pains. Full doses of Salicine relieved her.

(c). Purgatives. This is an important line of
treatment in neuralgic cases of rheumatic origin as well as in those of a gouty nature.

(d). Iodide of Potash is useful where the patient has neuralgic pains due to pressure on the nerves as perhaps causing absorption of deposits in various situations.

ANTISPASMODIC.

(a). Nitrite of Amyl is of great use, especially in relieving cardiac neuralgia. A tall young man with feeble heart, and below par, complaining of spasmodic neuralgic pains over the precordia, obtained relief from its use. Nitro glycerine acts in the same way.

(b). Hyoscyamus and

(c). Belladonna may be given in neuralgic pains in connection with the kidneys and bladder. A stout elderly man, who otherwise was in fair health, sent for me on account of darting pains in the region of the kidneys and bladder. No evidence of calculi could be found. He was relieved by the exhibition of these drugs.
ANTIGOUTY.

(a). Colchicum is given where there is a gouty diathesis. An elderly gouty woman came complaining of neuralgic pains in one foot. Her history, mode of life, and local deposits pointed to a gouty element in the case. Under treatment with colchicum she obtained much relief.

(b). Salicylic Acid is specially useful where there are darting pains along the nerves from the seat of a gouty effusion into tendinous sheaths, &c. A lady with gouty effusion into the sheath of right extensor longus pollicis tendon, had tried various remedies, mostly external, without avail. The effusion as well as the neuralgic pains disappeared under Salicylic Acid and dietetic treatment.

ANTISYPHILITIC.

(a). Iodide of Potash used in promoting absorption of syphilitic deposits. A clerk, aged 27, having a spastic gait with pain was put under Iodide of Potash treatment on account of the specific history, and as the doses were gradually increased he experienced great relief.
(b). Mercury. For the same purpose. A young gardener came to me for neuralgic headaches, and on enquiry I elicited the fact that he had had a recent attack of syphilis. His general health was good, and on using mercurial inunction his recovery was procured.

SALTS.

Chloride of Ammonium. I have prescribed this salt in a case of persistent facial neuralgia where quinine had not any effect. I gave it in an aqueous solution, the patient sipping it at the rate of 5 grains every 2 hours till relieved.

GENERAL ANAESTHETICS.

(a). Opium. A powerful sedative in all forms of neuralgia. It may be administered in many forms.

(b). Morphia may be preferred when opium disagrees.

(c). Chloral is given especially where neuralgic pains arise from sleepless nights. It is also useful in neuralgia of the uterus.

(d). Chloralamide is useful where there is slight neuralgia accompanied by sleeplessness. A woman, aged 66, with carotid aneurism, had slight
neuralgia and persistent sleeplessness. She got 40 grains of the above and obtained 8 hours' sleep, waking up fresh and feeling well and free from pain - no sickness, headache, nor giddiness, and pulse steady.

SEDATIVES.

(a). Bromide of Potash. This drug has been much used for neuralgia. It has a soothing effect over the system generally. A lady, aged 29, who was a "martyr to neuralgia", took it frequently, often taking 30 grains at bedtime. It appeared to act by soothing the nervous system, a state of quiescence resulting, and admitting of some sleep towards morning.

(b). Bromide of Ammonium. A most useful drug, especially for neuralgic pains in the head and hemi-crania. A seafaring man had suffered for years from attacks of neuralgia of the scalp at intervals. He had used quinine and other remedies. I ordered this drug before and during the attack with notably good effect.
SALICYLATE GROUP.

Salicine, Sodii Salicylas, Acidi Salicylici, have been mentioned before.

(a). Antipyrine, originally brought out as an antipyretic, but now also much used for its analgesic power. I ordered it to a patient suffering from supraorbital neuralgia with a very satisfactory result; and the same in the case of a lady who found it much more effective in "hunting off" the neuralgia than Bromide of Potash. When she took it often, it made her "sigh a great deal" as if "burdened with grief".

(b). Antifebrin. Relieves for a time the neuralgic pain, but in doing so brings out such a profuse perspiration that the patient feels somewhat exhausted.

(c). Phenacetin. Useful, especially for Hemiprania and Occipital Headaches. A patient who had been over suckling her babe had a severe neuralgic pain over the right side and back of her head. She got three 8 grain doses at 3 hours' interval which completely removed the pain.

(d). Exalgine. Of this drug see "Special Reference" further on.
LOCAL.

(a). Blisters, for example over the Great Sciatic Nerve. A married woman had an attack of intense neuralgia down her left sciatic nerve. The pain left her entirely, after blistering with Liq. Epispasticus.

(b). Sinapisms are very useful as counter irritants. A young banker who had neuralgia of some of the lateral twigs of the intercostal nerves derived relief by their application on the central side of, and at the seat of the pain.

(c). Liniments, such as those of Aconite, Soap, Ammonia, Chloroform, Belladonna, Opium, Menthol - alone or in suitable combination - well rubbed in over the seat of the pain. An elderly man came to me with pain over the region of the lumbar and sacral nerves, of purely neuralgic character. It was removed by a combination of Chloroform, Menthol, Aconite and Soap, applied over painful area.

(d). Ice bags, placed over the seat of the pain. I have only once tried this method in the case of a sick nurse who had right ovarian neuralgia. It proved of some service.
(e). Solid Menthol is used by passing it over the skin of the affected area. It produces a cooling and numbing sensation. It is specially used for neuralgia of terminal cutaneous twigs of the Lachrymal, Supratrochlear, and Supraorbital branches of the ophthalmic division of the 5th nerve, and of the temporal and malar branches of the Orbital from the Superior Maxillary branch of the 5th Cranial Nerve.

(f). Iodine. Used as the Liniment or the Tincture or the two combined and painted over the painful nerve. A young man, aged 22, of neurotic temperament, suffered from intercostal neuralgia on one and sometimes both sides. On using iodine he was much relieved.

(g). Capsicum. Used as a counter irritant. A footman in a low state of health owing to dyspepsia, suffered from intercostal neuralgia. He was ordered to apply a capsicum plaster over the seat of pain. This was followed next day by a complete cessation of the pain.

(h). Cautery. Useful in cases of neuralgic joints and spinal neuralgia. A man came complaining of neuralgic pains around his right shoulder joint and in its neighbourhood. The application of Corrigan's
button cautery on two separate occasions proved successful.

**INSTRUMENTAL.**

Section and stretching of nerves I have not myself performed.

(b). Correcting errors in refraction by the use of suitable spectacles. A middle aged woman suffered from orbital neuralgia. Relief followed the correction of her refractive anomaly.

(c). Acupuncture. Is specially of value for the large nerves, such as the sciatic. A young lawyer complained of neuralgic pains in the sciatic nerve, which persisted in spite of internal remedies. The use of the acupuncture needles at regular intervals helped him greatly.

(d). Tooth Extractions. Removal of peripheral irritation.

**HYPODERMIC MEDICATION.**

Has frequently been required. The Hydrochlorate of Cocaine in a 5 or 10\(^{\circ}/o\) solution is useful, but its effect soon passes off. Morphia is much more effectual and where possible should be injected at the seat
of the pain. It is of the utmost value in neuralgia of an agonizing type where other remedies have failed.

**ELECTRIC.**

By means of the continuous galvanic current, one of the poles being where possible over or near to the seat of the pain. A servant girl, aged, 24, had suffered for years from severe shooting and burning pains down her right leg. The cause was so obscure that in search of disease her knee joint had been excised and later her tibia had been resected. Electricity was recommended. One pole - a flat metallic plate covered with chamois leather - was placed over lower lumbar region and the other was placed over a number of points on the leg. I applied this twice daily, using 20, 30, 40 and sometimes 50 cells. After 3 weeks the pain diminished and later entirely disappeared. She was enabled to walk, an act she had not done for years.
Having endeavoured to set forth the different methods of treating neuralgia I have observed with examples, I now direct special attention to the subject of:

**METHYLACETANILIDE OR EXALGINE.**

I have singled out this drug for more full description with examples of cases treated by means of it, as a drug which has comparatively recently come before the medical world, and as one which it seems likely will obtain a place in the list of neuralgic remedies. I have thought it might be of interest to set forth its characteristics as I have observed them, and give a resumé of the literature procurable on the subject. There is something specially fascinating in studying a drug which has an analgesic action in small doses, while rarely causing any other symptom or inconvenience - a characteristic which separates it from drugs of an allied class.

**NAME.** The correct name for Exalgine is Methylacetanilide, which according to Professor Fraser of Edinburgh is "one of the four methyl derivatives of acetanilide, discovered by Hoffman in 1874, the other three being ortho, meta and para, and it has a formula
of C H NO". The Reporters to the "Pharmaceutical Journal and Transactions" of March 30th 1889 compare Exalginé with more or less allied bodies with regard to antiseptic, antithermic and analgesic properties stating that "Antiseptic properties are especially characteristic of alcoholic hydrated derivatives as phenol, naphthol, &c., antithermic properties are especially predominant in amidogen derivatives as acetanilid, kairin, thallin; and lastly that analgesic properties are at the maximum in amidogen compounds in which an atom of hydrogen has been substituted by a molecule of a fatty radicle, and especially of methyl as antipyrine or dimethyloxyquinizine, acetphenetidin and exalginé or methylacetanilide. But M. Giraud in a communication to the Academy of Sciences (Compt. Rend. April 8th p. 749) says "The name ortho-methylacetanilide can be applied but to one substance described by Beilstein and Kuhlberg under the name of aceto-orthololuid, and prepared by means of orthotoluidine and acetic acid. The substance prepared by M. Brigoumet is not new. Its true name is methylacetanilide for the phenyl radicle contained in its molecule is not substituted. This substance is used in laboratories for the
preparation of monomethylaniline," Dr. Lauder Brunton agrees that the aromatic derivatives are possessed of the physiological actions though in varying degree antiseptic, antipyretic and analgesic. In one category of bodies of which the phenols are the type the antiseptic properties predominate and give the prevailing character to the group. Others are antipyretic par excellence, while the third category of which exalgine would seem to be the best example are primarily analgesic, that is to say they possess a peculiar influence over the symptom pain of a curative character and quite distinct from the ephemeral effects of narcotics (Medical Press and Circular 26/2/90).

GROUP AND PHYSIOLOGICAL ACTION. Methylacetanilide may be placed among the Salicylate compounds, in the aromatic series of carbon compounds which contain Antifebrin (acetanilid) and which, when it is combined with methyl, forms a substance which even in small doses has more powerful properties in relieving pain than the original acetanilid. These groups of substances and aniline derivatives are "closely allied in their physiological as in the chemical affinities. They paralyse the motor power, arrest the heart,
reduce haemoglobin, and are eliminated through the urine after being transformed into anaamido-phenol. They all reduce temperature. The different principles vary in the character of their action on the nerve centres." (Binet "Rev. Med. de la Suisse Romande" April 20th 1889.)

M. Desnos of Paris in the "Lancet" of October 18th 1890 states that exalgine causes a destruction of oxyhaemoglobin, but no development of methaemoglobin though Henocque says there is. He used it in facial neuralgias, especially of congestive origin, ophthalmic zona, syphilitic anaemia, intercostal sciatica, renal colic and tabes dorsalis. If as M. Desnos states no methaemoglobin is developed it looks as if, when lethal doses are given, death were due to respiratory paralysis, and not to blood composition changes.

Dr. Alfred Grubb recommends Exalgine ("Medical Press" February 25th 1890) especially for dental neuralgia, tic douloureux, and most cases of migraine. Exalgine is also referred to, although much in the same lines as the above, in Lescher's recent "Materia Medica" 3rd Edition, and in "The Extra Pharmacopoeia" of Martindale and Westcott. Also in the "Year Book
of Treatment" 1890, Page 303, and in the "Medical Annual" 1890, Page 26, in the "Therapeutic Gazette" May 15th 1889, Page 339, August 8, 534, and in "Nat. Drug" April 15th 1889.

DESCRIPTION OF THE DRUG.

APPEARANCE. Its macroscopic appearance is that of colourless needles or white tabular crystals, and microscopically it appears in the form of crystals of a variety of shapes.

SOLUBILITY. It is very sparingly soluble in cold, but freely in hot water, rectified spirit, chloroform, alcohol (absolute) and whiskey or rum. The presence of Antipyrine helps its solubility for if one prescribes $\frac{2}{3}$ of a 5°/o solution of Antipyrine 2 grains of Exalgine will dissolve in it so also $\frac{2}{3}$ of 24°/o solution will dissolve 1 grain of Exalgine and in the same proportion.

ODOUR AND TASTE. It has a faint aromatic odour and a slightly pungent and almost saline taste.

On warming a little in a test tube, dry, it quickly liquefies and gives off an aromatic odour, and on cooling I found it crystallized on the sides of the tube, looking like frosted glass. Nitric Acid added
to Exalgine dissolved it leaving a clear colourless liquid, and when this was heated over a spirit lamp it became of a clear yellow colour and the fumes given off, although producing a slight expiratory effort, did not irritate. On employing Herr Hirschsohn's differential tests between Antipyrine, Phenacetin and Exalgine, I found that:

**Grains of Chloroform**

$\frac{1}{2}$ of Exalgine + 1 c.c. = completely dissolved

" " Phenacetin " " = undissolved and floats

" " Antifebrine " " = ditto

also that:

- Weak Sol. 10 vol.
  Chloroform Exalgine + Petrol Aether = Clear Mixture

  " Phenacetin " Turbid & Milky app.

  " Antifebrin " = ditto

also that:

- Aq. Sol.
  Antifebrin + Bromine Water = Bromine Comp. with clear colourless fluid above

Exalgine " = Fluid clear & yellow, no deposit

Phenacetin " = ditto
Exalgine burns with a yellow luminous flame. The Exalgine used is Brigonnet & Naville's, of St. Denis, France.

THERAPEUTIC ACTION. The primary effect usually obtained from Exalgine is the relief of pain without affecting the thermal or tactile sensibility when given in small doses. Given in medicinal doses I have never seen it produce cyanosis, rash, gastric nor cephalic disturbances and rarely lightness or giddiness in the head. It acts like Antipyrine when used for relieving the sensibility to pain, but with this important difference that the dose of the latter required to make it act as an analgesic is sufficient to cause an antithermic action as well, while the former (Exalgine) has the advantage that a small dose produces an analgesic, and an infinitesimally small antithermic action. Thus, in two cases of neuralgic pain where 10 grains of Antipyrine were administered without effect, 2 grains of Exalgine removed the pain completely.

Professor T.R. Fraser in the Royal Infirmary, Edinburgh, ("Lancet", February 15th 1890) and Dr. Gaudineau in the Hospital Cochin, Paris (Thesis) have by their observations supplied us with valuable data
which act as a guide to show in what forms of pain Exalgine can be employed with the best hope of success. On examining the results of Professor Fraser's numerous cases it is seen that in nearly all typical neuralgias - such as facial or neuralgia of arm - the pain was removed for a time at least, and that the cases which were not benefited were those in which the pain was less localised, requiring a general narcotic action, as for example in cancer of the liver, or lumbar abscess. From Dr. Gaudineau's cases it is seen that in purely neuralgic pain, and especially in cases of neuralgia a frigore and toothache, the best results were obtained. In pain arising from a more general cause, as in rheumatism he had not such good results from the exhibition of Exalgine.

I shall now proceed with the record of cases I have treated with Exalgine, from notes taken at the time:

J. P. Aged 27, sent for me on account of intense neuralgia. It was present in the cutaneous twigs of the crural branch of the genito-crural nerve, the external cutaneous nerve from the lumbar plexus, the iliac cutaneous branches of the ilio inguinal and ilio hypogastric nerves, and lesser sciatic twigs.
The pain was sufficient to prevent work or sleep. Two grains of Exalgine were ordered every two hours till four doses were taken, then every six hours. After the second dose slight relief was obtained. The relief was more marked after the third, and after the fourth dose the pain ceased entirely. Returning again four hours later the pain was again relieved by a further dose of 2 grains and did not return.

A. F. When over worked or worried patient was subject to frequent attacks of a severe form of neuralgia of all the cervical nerves at the back of the neck and extending up over the head - each attack lasting nearly 24 hours. Caffeine and Antipyrine alone and in combination had often been tried, without much success. For one of these attacks 2 grains of Exalgine were given, and repeated in two hours, when the pain "went a bit better". After a third dose, at the same interval, the pain subsided and did not return.

E. B. 8½ months pregnant. Felt fairly well excepting that she was troubled frequently with neuralgic headaches. Two grains of Exalgine removed the headache in 45 minutes completely. A second dose removed the headache when it returned on the following
day. One powder was taken occasionally as required, and on each occasion a dose of 2 grains was sufficient to give complete relief.

M. M. Was subject to frontal neuralgia. An attack came on for which I prescribed 3 grains of Exalgine to be taken every hour for four hours as the pain was severe. After the second dose in half an hour the pain began to subside, and had quite gone after the fourth dose, not to return. No inconvenience was in any way felt.

M. S. Age 40, was being treated in Hospital for acute bronchitis and was getting slowly better. Being rather exhausted by this illness, frontal neuralgic headaches sometimes occurred. One 2 grain dose of Exalgine always cleared them off.

A. C. Aged 33. Had been living under bad hygienic conditions, and was "down" in health. Towards bedtime the patient on several occasions complained of a neuralgic headache, which, if unrelieved, made sleep impossible. A 2 grain dose of Exalgine relieved the headache in 30 minutes and sleep followed the removal of pain.

M. B. Four days after her accouchement, was getting on well, when sharp and darting pains...
appeared over the face and head. Two grains of Exalgine were given followed by two more in an hour. The pains disappeared half an hour after the second dose. The pain did not return until next morning when 2 grains more entirely relieved, and on its return in the evening another 2 grains expelled it. The same occurred next day with like result.

M. N. Had a chronic cough accompanied by neuralgic pain around the orbit. She took 3 grains of Exalgine every three hours and after the third dose got complete relief. The pain returning later, she took 3 grains thrice at intervals of 2 hours. Though relieved she felt slightly faint.

REMARKS. These cases have been those of painful neuralgia of the nerves of head and neck, in which, although severe, the pain could not be called agonizing. In each case the pain was removed completely by from 1 to 3 doses of 2 or 3 grains each.

The next four cases are also of neuralgia of the face and head, but in which the pain was very intense, in fact agonizing and occurred in persons who were naturally brave.

K. P. Age 22. Intense neuralgia confined to supra and infra orbital nerves, very painful to touch
and making patient quite unfitted for work. Four grains of Exalgine were given every 3 hours and after 4 doses it failed to relieve. Quinine and Bromide of Ammonium were then given along with the above when no change occurred. The pain still continuing to be very severe, after an interval three grains of Exalgine were given along with eight grains of Antipyrine and a little Morphia. This combination gave relief after the first dose, and after two other doses the pain completely left and did not return.

M. M. Completely prostrated owing to intense supra and infra orbital neuralgia, also of the side of face and neck. Three grains of Exalgine were given every hour, and after the third dose the pain became more bearable though still bad. The patient desisted from taking any more until next evening when the pain again increased. Three 3-grain doses were then taken at an hour's interval between each dose, and the pain gradually subsided in the region around the left eye, but some Chloral and Salicine had to be given to remove the other pains and obtain sleep.

M. H. Was not subject to neuralgia attacks at all. She was seized with an intense attack of neuralgia of the supra and infra orbital nerves and
facial branches of the seventh cranial nerve. There was great pain on pressure over points of emergence and the pain increased in severity. Two grains of Exalgine were given every two hours, and after the fourth dose she was slightly relieved. Four grains were then given and 20 minutes later the pain subsided considerably making the patient more comfortable. Next day the pain returned with full vigour and was at times agonizing, and in spite of 4 grains being given twice with 2 hours' interval the pain was unrelieved, an opiate having to be administered to give ease. Later on when the more acute pain had subsided Exalgine was used again with good effect.

E. C. Aged 27, married. Had been subject to severe periodic attacks of neuralgia over the right orbito-temporal region for the last five years, and as nothing had done her any good Exalgine was tried. The attack began at 11 a.m. and increased in severity. At 1 p.m. she took a 3-grain dose of the French preparation (M.M. Brigonnet & Naville) and the same dose was repeated at 2, 3, 4 and 6 p.m. without giving any relief or discomfort. At 9 p.m. she took 3 grains more, and almost immediately afterwards felt absolutely powerless. This lasted for five minutes, the
patient remaining quite conscious. She compared the sensation to that of taking chloroform before she was quite "under". At 12.45 a.m. the pain still being very severe she took a seventh dose, and in 15 minutes felt a feeling of impending death, could not speak and gasped for breath. Her pallor was intense, the pupils dilated, the limbs became quite rigid, heart palpitated, she felt utterly powerless, and broke out into a profuse perspiration. By the aid of fresh air, stimulants, &c., the attack passed off in 15 minutes, leaving her very prostrate, with ringing sounds in the ears. The pain, which frequently lasted only this length of time, now left her. Other functions remained normal, and no rash developed. This happened between her menstrual periods.

REMARKS. These four cases were all neuralgias of an agonizing type, which were not relieved even by doses of considerable or almost toxic amount. One of these cases whilst the pain was within bounds was relieved by Exalgine both before and after the climax which required the opiate. The last case mentioned - that of Mrs. C. - in which the drug was pushed to give it a chance to relieve the pain - along with the following case I published in the "Lancet" of March 7th
1891 as being cases of over dose.

M. G. Had been taking two-grain doses at intervals for a neuralgic headache, obtaining relief, though sometimes feeling slightly faint, but by mistake an undetermined over dose was taken. She soon experienced a feeling of complete prostration, her limbs became powerless though not rigid, felt as if she were sinking through the bed, slight perspiration, and thought she was dying; breathing became faint and shallow, and she was nearly pulseless at the wrist. Mustard, hot bottles, and stimulants brought her round, but she felt very weak for many days afterwards.

The first of these two cases of over dose was the most interesting, as the amounts and times of administration were more accurately noted.

G. J. Aged 27, married. Subject to frequent attacks of "faceache". Her teeth on the affected side (the right) were in a very carious state. When feeling down in health, an attack of faceache proceeding from the teeth and extending upwards, was sure to follow, and this prevented rest at night. I ordered 2 grains of Exalgine to be taken every 2 hours till three doses were taken. After the second
dose the patient obtained some relief from the pain and it disappeared completely after the third dose.

E. E. Came asking to get his first upper left molar extracted on account of severe pain experienced for the last two weeks. There was no inflammation at all around the tooth nor any decay in the tooth itself. Two grains of Exalgine were given every 2 hours, which relieved him.

REMARKS. These were cases of neuralgia proceeding from decayed teeth, and which derived some benefit from the use of Exalgine.

E. D. Acute Rheumatic Fever. Under usual treatment. Salicylate of Soda did not relieve the pain. There was a strong suspicion of its being of gonorrhoeal origin. The pain in the left elbow and right knee joints remained very severe. Two grains of Exalgine were given without effect, and 2 more in 2 hours without any change. The following night 2 grains were again given for the pain and with some relief, further relief being obtained by 2 grains 2 hours later. The next evening the powders were given as before with considerable relief, though the night after the relief was very slight.

Three weeks later the rheumatic symptoms were
much improved, but very painful paroxysms up and down the affected arm and leg were complained of, now perhaps rather of a truly neuralgic form of pain. Exalgine was again given alone, and sometimes in combination with Antipyrine, and it relieved at every dose.

C. Mc.D. Had a chronic ulcer of the leg which gave rise to shooting pains up the leg. Two grains of Exalgine were given every 3 hours regularly, and after three doses the pains were decidedly better.

Two months later the patient complained of suffering from rheumatic pains around her knee joints. Two grains of Exalgine were given and purging resulted within an hour, followed by considerable relief. On a repetition of the dose the same happened - purging followed by some relief of pain.

R. H. Was suffering from Pleurodynia and lumbago, other functions being normal. He took 2 grains of Exalgine for the pain when he went to bed, and being relieved he fell asleep. Wakened by the pain in 3 hours afterwards when a second dose was taken which again relieved for the rest of the night. The same occurred the following night and in 3 days he was quite well. The bowels were much looser after the use of the medicine.
REMARKS. In those cases there was a rheumatic element as well as neuralgic. If the pain was very severe the relief was slight, but if more moderate in severity the relief of pain was well marked. In two of the cases looseness of the bowels followed its exhibition.

L. M. Had been subject to gastro-hepatic headaches for which Antipyrine and Caffiene alone and combined had been used without avail. Exalgine was tried. Two grains were administered every two hours till four doses were taken, but the headache persisted in spite of this.

W. K. Suffered from cancer of the liver with great emaciation. The pain specially over the right hypochondrium and epigastrium and was at times very severe. Exalgine was tried in 2-grain doses at frequent intervals without giving any relief.

A. M. Chronic ovaritis with enlargement of left ovary and slight affection of the right. She had suffered severe pain for a number of years. All the usual local applications had been tried without success. Exalgine in 2-grain doses three times a day was given without producing any effect. She received 3 grains twice a day, and though the pain lessened,
it was doubtful if this result was due to the Exalgine.

REMARKS. In these cases other serious disease was associated with pain for the successful treatment of which a more general and potent sedative was required.

A. S. Age 26. Had suffered for years from diseased aortic valves. Was subject to distressing neuralgic headaches which sometimes kept her awake all night. She got a 2-grain dose of Exalgine which in 25 minutes relieved the headache without any inconvenience.

R. M. A soldier, aged 48, suffering from aortic aneurism, had been ill for over a year. Dullness on percussion, blowing first sound. Paralysis of left vocal cord, hoarse brassy voice and general unfitness. He was taking large doses of Iodide of Potassium, with a little arsenic. As his health improved the pain over the aneurism became at times very severe.

Nitro-glycerine Tabellae B.P. $\frac{1}{100}$th grain one or two at a time gave him relief sometimes but not always. He was ordered to use 2 grains of Exalgine when the pain was bad. Half an hour after taking
each powder the pain left him even though it had been very intense before. His temperature remained at 98.8 and pulse at 78 per minute all the time. The only thing the patient complained of was that on one or two occasions he had palpitations after taking the powder.

REMARKS. These cases are instances of neuralgic pains arising from disease in the circulatory system in which the administration of Exalgine caused relief within half an hour.

EXALGINE IN HEALTHY MEN. I tried the effect of Exalgine upon myself. I was feeling in perfect health and before the first dose a pulse tracing was taken, the rate being 63 per minute and respiration 19. See tracings.

I then took 3 grains of Exalgine and felt no effect whatever; the pulse 25 minutes later being 68 and respiration 18. See tracings.

45 minutes after first dose a second dose of 3 grains was taken and 25 minutes later pulse was 68 and respiration 18. See tracings.

45 Minutes after second dose a third dose of 3 grains (9 grains in 90 minutes) and 25 minutes later pulse was 65 respiration 16. See tracings.
3 hrs. Before curare, Pulse 65, Respiration normal.

2 hrs. 30 min. after 8 gr. of curare. Pulse 65, Respiration 20.

2 hrs. 20 min. after 3 gr. dose of curare, 45 min. between each. Pulse 65, Respiration 20.
During the period of observation and afterwards I was conscious of no effect of any kind.

B. McD. An Edinburgh University M.D. had the same tests applied with negative results. See tracings.

R. C. A healthy friend. Same as above. Negative results.

In none of these cases was there any practical alteration after administration.

GENERAL CONCLUSION. From the above series of cases as well as from further observation of cases of which no notes were taken, I have come to the following conclusions:–

That Exalgine does not in medicinal doses cause any derangement of the digestive organs, nor eruptions, nor alteration of tactile and thermal sensation, nor perspiration nor cyanosis. It occasionally produces a slight faint feeling, looseness of the bowels and sometimes slight palpitations. An effect upon the urine secretion is mentioned by some observers but I have not observed such change.

DOSAGE. The dose ranges from ½ to 4 grains at intervals. I do not think it advisable to give more than 16 grains in the 24 hours. The effects of over
dose have been enumerated in the cases on Page 28.

MODE OF ADMINISTRATION. Being so sparingly soluble in water, I have made it up in a variety of ways. Rectified Spirit in the water makes a good solution of it. Tincture of Orange and the Syrup of Orange Flowers makes it pleasant to take, but a precipitate is apt to form. It is not suitable to give Exalgine along with Bromide of Potash, because on trituration in a mortar, a pasty mass is formed similar to Chloral and camphor. Spirit of Peppermint aids its solubility, and so does Spirit of Chloroform. Antipyrine, if given along with it in the proportion of 2 grains to the drachm of a 5% solution of Antipyrine, helps its solubility. It can be given in the form of Tabellae ½ or 2 grains (Allan & Hanbury). I have also given it dry on the tongue and washed it down with a mouthful of water or inside wafer papers.

As to its use in practical medicine, I think that

(1) It is of great value in all truly neuralgic pains if not too severe.

(2) That in medicinal doses it is a safe, simple, non-irritating drug.

(3) That it is not multiple nor intricate in its action.
(4) That it is often of use in pains which are not purely neuralgic.

(5) That if it fails to act no harm is done.

(6) That as its analgesic power though distinct is not very powerful, it has not much effect in the case of very intensely agonizing neuralgias (excepting in combination with such drugs as morphia, &c.) or in grave malignant disease.

(7) As a drug for conveniently relieving many distressing pains of lighter nature, I think it well deserves to be placed on the list of drugs for the relief of pain.

Arthur Conning Hartley