The Therapeutics of Pilocarpine.

Thesis, 1881

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M.D. C.M. 1874

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In the following pages I have endeavored to present in a condensed form some parts of the copious literature which has during the last five years appeared on the subject of Pilocarpine. I have mainly concerned myself with the therapeutic actions of the drug, and have given in detail an account of some cases which have occurred in my own practice, where the action of the drug was conspicuous.

Pilocarpine is obtained from the leaves of the tree Pilocarpus microcarpus, a member of the natural order Rubiaceae, a native of Brazil, and now chiefly imported from the neighbourhood of Pernambuco. The crude Pilocarpine is a viscid, syrupy liquid, soluble in water, alcohol and chloroform, and some crystallizable salts with nitric, sulphuric, and hydrochloric acids. It is usually stated to be the active principle a alkaloid of Pilocarpus; this term, however, comprehends two other South American plants, viz., the Veronica Pilocarpus...
a kind of pepper, and a species of Herpesta, belonging to the natural order Solanaceae. The leaves and young shoots of the Pilocarpus have long been employed by the natives of Brazil as a remedy in snake bites and fevers. The Pilocarpus appears to be the Tabanardi, which was first introduced to the notice of the medical profession in Europe by Dr. Cun-

liquo of Paramaribo, who gave specimens of the plant to the late Professor Sulzer, by whom it was first tried in the Beaujon Hospital, Paris, in the year 1873. The leaves of the Pilocarpus contain also an oil called Pilocarpine, which is similar to the oil of lemons. About 100 kilogrammes of the leaves of the Pilocarpus yield about 70 grammes of Pilocarpine. I am unable to ascertain to whom the credit belongs of discovering this active principle. It seems to have been extracted almost simultaneously by Martin-dale, Gerard, Hardy, and Ryerson. In this country it was first isolated from Tabana- 
di leaves by M. Dr. G. Gerard of University College Hospital, who separated it as a
and quoted in
London Med. Record. March 18
bichlorate in the beginning of 1875. It is also stated to have been discovered by Merck, who separated it as a hydrochlorate. When first discovered by Byrson, he named it "Tabaramine," a little later it seems to have been obtained in a pure form by Mrs. Hardy who gave it the name "Pilocarpine".

It was discovered in August last, 1850, by Harman and Meyer, that Tabaramine leaves contain another alkaloid besides Pilocarpine: to this second alkaloid they gave the name "Tabarin," and found that it was in many respects analogous to Pilocarpine. They found, moreover, that this Tabarin was present as an adulteration in all ordinary specimens of Pilocarpine, and that its presence they ascribed the somewhat contradictory results which had been published by physicians using Pilocarpine. It is of the first importance therefore in using this drug that it be obtained of absolute purity.

Merck's hydrochlorate of Pilocarpine is what is generally employed in this country, it is guaranteed 100% pure and is the only
some I have used. It consists of transparent white crystals and is readily soluble in water.

Since the discovery of Pilocarpine, the preparations of the native plant and other varieties of Tabernandi have gradually fallen into disuse as therapeutical agents. This is to be accounted for by the fact of Pilocarpine possessing all the virtues of the plant: it is, moreover, easier to administer, more rapid and certain in its effects, the dose can be more accurately determined, and it does not produce stranguary. Before the discovery of Pilocarpine it was found that the preparations of Tabernandi were most uncertain in their effects. Pilocarpine can be given both by the stomach and by subcutaneous injection: the latter is the better which is generally employed, and is certainly the preferred where a rapid action of the drug is desired. I have always used a 2 per cent solution, 1 which 16 m. are said to equal to 80 m. of infusion of Tabernandi leaves. The standard dose for an adult of this 2 per cent solution is 10 m., which is equivalent to
D. Henry of Manchester advises the instillation of Ethyl Nitrite to counteract any signs of collapse which may follow the use of Pitocarpine.

5 of a grain. N. Bertkau states that the dose should never exceed 5 of a grain and has never given more than 5. N. Kurz has gone the length of injecting 2 of a grain, but this was in the case of a patient who had had the drug repeatedly. N. Kurz has injected 3 of a grain. This is the largest dose I have found recorded as having been used. It is as well not to use the drug soon after a patient's heat, as bleeding would be almost certain to follow.

The danger incidental to the use of Pilocarpine is that a fatal syncope may be induced. I have never seen any bad effects resulting from its use, but I have always had at hand a solution of Atropia, to counteract, if need should have arisen, the depressing effects of the drug. The antagonism between the actions of Pilocarpine and Atropia is well established, and it has been elaborately written out by Langley, Ruiger, and Ashworth. I shall have occasion to refer to this point further on.

The rash noticeable and most valuable
B. I. T. J. Journal of Anatomy & Physiology.
effects of Pilocarpine consist in its rapid diaphoretic and chologogue powers. The diaphoresis is due to the widening of the calibre of the arterioles, the tension of the whole vascular system being at the same time relaxed; in other words, a paralysis of the vasomotor nerves ensues. Within two or three minutes after its injection the face flushes, the whole skin becomes warm and moist and the cardiac contractions are quickened. If the fingers be placed upon the pulse besides noticing that the rate is increased, it will also be observed that it becomes larger, more easily compressible and diastolic."

Dr. Service gives a set of phlebographic tracings which illustrate fairly the above suggestion. The patient from whose radial artery the tracings were taken was a man recovering from an attack of acute nephritis. Just before the injection of the drug the pulse was 76 of good tension. The dose was 1/4 of a grain of the nitrate, a humane dose. Dr. Service remarks. Within 3 minutes of the injection the pulse had risen to 116, was greatly reduced in tension and was mortally diastolic. At 10 minutes, the pulse
was still high, 110. After this the pulse steadily fell, and, in one hour after the injection, had regained its former figure, 76, and gave essentially the same drawings as prior to the use of the drug. The other physiological effects had likewise ceased at the end of the hour.

In the same paper, Dr. Lewicke gives tracings from a case which illustrated the antagonism between Adrana and Pilocarpine. In this patient the pulse was 80 just before the injection. The dose of Pilocarpine was 1/4 of a grain; in 15 minutes the pulse had risen to 120; it showed the same diuresis, and reduction in tension as before related. At 15 minutes the top of a grain of acetate of Pilocarpine was injected, with the result that in 5 minutes the pulse had fallen to 76 and the tension was similar to that which had existed before the Pilocarpine was given. The sweating and salivation were all likewise checked while at their height within 5 minutes after the administration of the Adrana.

This antagonistic power of the one drug over the other has evidently been the means
Centralblatt für prakt. Augenheilkunde

* Since writing this, another case of Belladonna poisoning
   successfully treated w. Pilocarpine has been recorded.
   Patient swallowed 3 1/2 and 3 1/2 of Liniment Belladonna B.D.

Four doses of 1/5 of a grain of Pilocarpine were injected every
15 minutes; this did not cause the least perspiration
she recovered perfectly.

Nicholas Graham F.R.C.P.Ed. Surgeon to the Caled
goal Hosp. for Women & Children.

Journal of Physiology Vol. II. No. 2.

Page 134.

July 1879.
of saving life on the following remarkable case:

Mr. Purves of Duda-Beck was called to see a young man, aged 19, who had drunk a watery solution of nearly 2½ grains of the sulphate of Atropia. The patient had been

by Dr. Purves two hours after the occurrence when the symptoms of Atropia poisoning

were very severe. The centigramma of Pitocarpine, equal to 1/10 of a grain, was at

once given subcutaneously and repeated almost every ten minutes till thirteen centigrammas

had been given. Within 3 hours from the

time of his swallowing the Atropia, the

man had entirely recovered; even the dilata-

tion of the pupil which had been most

strongly marked had quite passed off.

It has been demonstrated by

Dr. Ringer and Murrell that an alkaloid

known as Piturin, derived from the Piluri

a Solanaceons plant, is also an active anti-

dote to Pitocarpine. In the heart of a

thick white frog, beating at 52 per minute

they applied a small quantity of a 2 per

cent solution of the Nitrile of Pitocarpin
Journal of Physiology
and in 1/2 a minute, the heart stopped. Soon after they applied a little of a 1 per cent. solution of the nitrate of Pilocarpia, and in 15 seconds the heart began to beat again and in one minute beat strongly at 24 per minute, in 3 minutes at 32, and soon after at 40.

This was but one of five experiments which proved most conclusively, that Pilocarpia will quicken and greatly strengthen a heart slowed and much weakened by Pilocarpine & even restore the contractions to a heart arrested by Pilocarpine.

Further experiments by the same gentleman showed that an antagonism also exists between Pilocarpine and Muscaria, the extract of the “Manila Muscaria.” The application of this Muscaria to frogs’ hearts very much weakened and frequently stopped the contractions; on applying a solution of Pilocarpine to arrested hearts, vigorous contractions were restored, and strength and frequency of contractions resulted in the case of slowed & weakened hearts. This is a remarkable instance of an antagonism between two drugs.
December 1879. Page 250

otherwise so similar in their effects on the animal body, muscarin being little Pilocarpin a
swearer and lachlor.

A further series of experiments by D. Ringer and N. E. A. Macleod was undertaken to ascertain the relative paralysing action of
Atropine and Pilocarpine. The conclusion arrived at was that the sulphate of Atropine
topically applied was almost as powerful a
paralysing of the heart as Pilocarpine.

In all these experiments the solutions
of the drugs were applied locally to the heart
and in relatively large doses.

We have seen from D. R. West's animal
experiments, referred to on page 6, that an acceler-
ation of the heart's action is one of the im-
mediate effects of the drug. This is not usually followed by any secondary depression:
if, however, the cardiac muscles be diseased
a serious and critical condition may ensue.

D. Pichina has published hypotensive
tracings which show that in very sensitive
patients, and in cases of heart disease, one
or two small doses of solution of Pilocarpine
June 2nd, 1938

At 2 p.m.
cause a slowing of the pulse and arrhythmia. The
remnants that muscular degeneration of the heart,
compensated disease of the valves, or other impediments
to the circulation as pulmonary emphysema, extending
pleural effusion, high fever, demand great caution
in the use of Pilocarpine lest collapse should occur.

In a paper on the action of Pilocarpine
on the submaxillary gland of the dog, W. Langley
sums up the physiological effect of the drug as
follows.—In dose does, i.e. up to about 30
milligrams, it causes an action on the gland very
similar to that produced by stimulation of the
chorda tympani. It causes a rapid secretion &
a considerable increase of blood flow. Both secretion
and blood flow gradually declining. Its effects are
little if at all altered by section of the chorda
 tympani or of the sympathetic nerve. Stimulation
of the chorda tympani increases the pilocarpine
effects, i.e. the nerve is functionally unaltered.
Stimulation of the sympathetic diminishes its
effects, so that this nerve too is functionally unaltered.
The secretion is stopped by injecting atropia, (a fact for some time known) with a quant-
ity of atropia sufficient to paralyse the
Prachtliner, July 1877.
(from Berlin Klin. Forsch. 1877 No. 1
and Bayer Acryl. Inn. Blatt 177 No. 8)
Stada sympathetic does not prevent a relatively large quantity of Pilocarpine from producing its ordinary results. In fact, the secretion in absence of secretion is dependent on the relative quantity of the 2 poisons present, just as is the share while or beat of the heart. In larger doses, instead of causing a stronger caloric flow, it causes none at all, and further prevents the stada sympathetic from producing any secretion. It considerably diminishes the blood flow through the gland, as well as the effect of the stada sympathetic on the blood flow. It does not, however, stop the sympathetic secretion.

I shall not here stop to consider the physiological action of the drug on the various other organs of the body, as such will be briefly referred to while dealing with the therapeutic actions of the drug.

In one of the earliest articles I have found of Pilocarpine as a therapeutic agent, it is stated that Mr. Bardeleben & O. Lauter both agree with Stedall that in doses of 0.04 of a grain subcutaneously Pilocarpine produces the specific action of...

Practitioners. December 1876
Tabanadi without its unpleasant secondary effects.

I have had no experience of the use of the drug in diseases of the Circulatory System, and as already mentioned the greatest care is required in its employment in such cases. The following case, however, is interesting as showing that even where this system is seriously diseased the use of the drug may be beneficial. In a patient with pulmonary emphysema, bronchitis, oedema of the legs, arterio-sclerous arteries, feeble and irregular heartbeat, and dyspnoea, Dr. Kurz injected 3/5 of a grain of Pilocarpine. The bronchial mucosa was expectorated with greater ease; the excretion of urine was also increased; the oedema of the legs ab abate diminished. The dyspnoea was less severe, and the patient who had neither headache nor haemoptysis felt quite comfortable. The drug was repeated several times, always with good effect.

I will now refer to the therapeutical action of the drug in cases where the Intracerebral System is involved.

An interesting experience of the effects of Pilocarpine on two cases of unilateral sneezing is recorded by Dr. F. K. Young and Mr. W. H. Bury.
The first of these cases was a man aged 46 suffering from Paraplegia and with marked sweating over the left side of the body. He had suffered for nine years from this unilateral sweating, and by subcutaneous injections of Oto-carpine, varying in dose from 1/3 to 1/2 a. grain, effected a complete cure. He remained under observation for several weeks after the Oto-carpine had been discontinued.

The second case of unilateral sweating was a man, aged 55, suffering from right hemiplegia. The onset of the disease was at once followed by profuse perspiration over the right side of the body, most noticeable over the right half of face, neck, and right half of the scalp. The perspiration was always seen in beads on these parts, and was more abundant during sleep. Activity was affected on the right side, for the right side of the moustache did not grow while the left side grew well. The first three injections were followed by a decided diminution in the perspiration on the right side of the body. After the 4th and 5th injections, however, the
Practitioners II 1879. Page 430.
drug lost its curative effect, for though it produced abundant diaphoresis at the time, it did not, as in the case of the first injection, afterwards lessen its abnormal amount.

In a paper on the treatment of the night sweats of Phthisis, Dr. W. M. Russell tabulates the results of his experience of Phinearpine in such cases. In each case the drug did some good and in the majority of the patients great relief was experienced. As a rule, the nitrate was employed: in some few cases, the hydrochloride, and both appeared to act equally well. The drug was always given by the mouth, both in simple solution in water and made into a pill with sugar of milk. The dose given was generally the 1/20 of a grain. Once, at the dose 3rd daily, twice 15 grains a day, and once only at bedtime. If the sweats were confined to the night, a dose at bedtime seemed to do as much good as if given 3rd daily. When the sweats were very severe at night it was found a good plan to give 3 pills during the night, if the patient was likely to sleep, to give 3 pills at intervals of 1/2 an hour before going to bed. Very
Archives Générales de Médecine
March 1881.
Slight benefit was experienced by the patients the first night; on the 2nd and 3rd nights a decided improvement occurred, and by the end of a week the sweating had disappeared or was so slight as to cause no inconvenience. After the sweating had been thus checked, there was as a rule no return for many weeks. In 4 cases doses of \( \frac{1}{2} \) a grain were given on alternate nights at bedtime. These large doses certainly checked the abnormal sweating very successfully but were inconvenient to the patients and favored no advantage over the ordinary medicinal doses.

At the meeting of the French Academy of Medicine, January 25th, 1861, Prof. Petruinard read a paper on the use of Picocarpine in Koch’s transpiration of the feet. He used the inhalation Subumbrously, and concluded that the drug had a curative action, that the suppression of the transpiration of the feet, were desired to markedly, does not injuriously affect the body, and that the drug acts by producing a derisive and Vicarious hypersecretion in the Salivary glands.
Practitioner February 1881. Page 128.
(Signed by Peterburg Med. Nachlass. July 19, 1880)
Prof. Piel gives an account of the use of
Pilocarpine in Skin diseases, as in Prurigo, Psoriasis,
eczema, Pruritus, urticaria chronic, albaea erecta.
Rhinothorax, albaea pityrodes, acne, hyperkeratosis,
pemphigus chronicus and other eruptions, i.e. in
all skin diseases where the location of sweat is
here a less altered. This experience, as recorded, extend-
ed over a period of 2 1/2 years. The drug was given
in solution, by the mouth, in doses of 6 to 1/2 grain
2 to 3 a day, 2 to 3 hours after food. Respiration fol-
lowed in 7 to 5 minutes. After several weeks'
use the dose had to be increased, unless it had
previously been titrated. The skin became
after it became plastic, the healing diminished, the
hair was less brittle. The use of the remedy
for months in no way disturbed the general
health. In 32 cases of Prurigo the momentary
itching disappeared and the relapses were found
what delayed: while again in 25 cases of Prur-
icae the effect was seen. In 2 cases of pustules
venereal and 1 of urticaria a cure was effected:
in Eczema the result was hot decided. In 10 cases
of Albaea pityrodes good results followed:
whilst in 36 cases of Albaea erecta no desir-
ing result was obtained. 


and Glasgow Med. Journal Tune 1879.
In the itching of the skin in cases of jaundice, Professor Mackenzie of Edinburgh, has at¬
tested the trial of Pilocarpine. In a case of catarrhal jaundice, which he mentions, the daily injection
of 1 grm. of the nitrate of Pilocarpine gave great relief to the intense itching, and
thereby produced sleep for the patient.

The report of this case induced Dr. country doctor to give a patient afflicted with
intractable itching a similar dose of Pilocarpine with the effect of producing a complete cure. The
drug was in this case given by the mouth and produced its effects in half an hour. Only one
dose, apparently, was used in this case.

As regards the itching of jaundice this is
a most valuable hint, as I have never seen
any remedy, whether applied externally or in
heroinally, of the slightest benefit in such cases.
I have not as yet had an opportunity of testing it.

Mr. G. Schmitz claims for Pilocarpine
the power of reproducing hair on a bald surface,
in certain instances at least. He quotes the
case of a man, aged 60, completely bald except
and Mackinon Jan. 7/61
for a few white hairs on the scalp was operated on for double cataract. There remained in one of the pupils a fragment of membrane, to absorb which the S. gave, within 14 days, 3 subcutaneous injections of the mercuric of Pilocarpine. The membrane disappeared, but also the hair began to grow to such an extent that at the end of 16 months no baldness remained. The new hair was black and white.

Another patient, aged 34, with a separation of the retina, had on the forehead a bare patch the size of a playing card. Two injections of Pilocarpine had only cured the eye affection but also produced an abundant hair growth on the bald patch. It is not stated, however, what was the cause of the baldness in either instance.

S. B. Lervin gave Pilocarpine subcutaneously to 32 syphilitic patients at La Charité Hospital, Paris: of these, 25 made good recoveries, i.e. 78 per cent. Among these were several severe cases including one of gummas. Pilocarpine. The duration of treatment varied from 14 to 423 days, on an average 34 days. The quantity injected amounted, on an
Practitioner II 1879. P.365
average to 0.327 gr. each injection consisting of 15 minims. The drug appeared to be as valuable as Mercury in this disease, but were relapses more frequent under this treatment. The tendency to collapse was the only objection to its use. Among the 7 cases, which were not benefited by the Pilocarpine, I suffered from such severe collapse that it could not be repeated. Haemorrhage occurred in the case and endocarditis in another. In 2 severe cases, with jaundice and extensive sclerosis of the brain, no improvement occurred.

From the use of Pilocarpine in 41 cases of Intermittent Fever, Dr. 

This writer concludes: - that the haemate of Pilocarpine given hypodermically will promptly and often the chill of material intermitten fever. In a large proportion of cases thus treated the paroxysm abates, terminating in the sweat caused by the Pilocarpine, these being in hot state. Such abatement of a paroxysm is in itself sufficient to cure many cases, while it is at all times a valuable
Journal de Thérapeutique.
N° 25. 1879.
and Stastow Med. Journal Feb. 80
und Machikinaen I./80. P. 459

Med. Jahrbücher 1879
adjunct to treatment with Quinine during the intervals. A dose of Pilocarpine sufficient to produce these effects acts quickly without causing exhausting diaphoresis or unpleasant Pharynx. Such a dose was found to be 1/3 of a grain. The promptness with which an adequate dose acts to start a chill suggests that it may possibly be of use in febrile intermittent or fever where the prevention or a full development of a Paroxysm is often of the utmost importance.

Professor Pier of Bordeaux confirms the value of the use of Pilocarpine in febrile and cites it cases in proof. He states that while cutting short the afebrile period, the same time reduces the volume of the afiebrile.

Dr. Robinson narrates a case of afebrile where the afebrile attack was not that, almost anness by the injection of 3 grain: the previous attacks had continued in spite of the usual treatment for many months.
London Medical Record.
February 1881.
In Diphtheria, it would appear that Pilocarpine has been of great value in the hands of Dr. Sulman of Cracstadt. He was led to try it in such cases in the expectation that the abscess, pharyngeal affection induced by the drug might loosen the diphtheritic membranes. He first used it in an outbreak of the disease where 7 of one family were attacked, one after the other, 3 of the cases having the severest hyphoid symptoms. The first patient attacked was not treated with this drug, but the 2d was given it in moderate doses and on the following day there were fragments of the diphtheritic membrane in the pharynx. The other 5 cases were all treated with Pilocarpine and all recovered within from 2 to 4 days after the drug was begun.

Since this first trial up to August 1850, Dr. Sulman had treated 66 cases of genuine diphtheria (rachenbräune) with this drug, and with the brilliant result that all the patients recovered in from 1 to 3 days. He explains that it would be unfair to argue that some of the cases could not have been true Diphtheria, as they were all examined...
with great care, and in the worst cases the course of infection was traced. Of these 66 cases, 15 were of the best Virulent type, and of these according to his experience 1/3 would have died but for this treatment: 33 cases were serious in that the membranes were extensive: the remainder of the cases were slight: They were all treated with Neosalvarsan, Quinine, and Salicylic. All who were seen early, while the membranes were still loose, recovered quickly, i.e. in 24 hours. The membranes and ulceration seemed to be improved, the fever subdued, and the deeply congested and mucous membranes soon became moist & later red.

D. Sullivan has also used the drug with benefit in cases of trachoma, crops, and large sinus trichini. The drug was always given by the mouth, and his formulas were as follows:

I. For children

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilocarpine</td>
<td>1/3-1/2%</td>
</tr>
<tr>
<td>Pepsin</td>
<td>2-4-1/4</td>
</tr>
<tr>
<td>Acid hydrochlor.</td>
<td>1 gr.</td>
</tr>
<tr>
<td>Ag. destil.</td>
<td>1 ml.</td>
</tr>
</tbody>
</table>

23 every hour.

II. For adults

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilocarpine</td>
<td>1 gr.</td>
</tr>
<tr>
<td>Pepsin</td>
<td>2-4-1/4</td>
</tr>
<tr>
<td>Acid hydrochlor.</td>
<td>1 ml.</td>
</tr>
<tr>
<td>Ag. destil.</td>
<td>1 ml.</td>
</tr>
</tbody>
</table>

23 every hour.

No ill effects ever followed the use of the drug, & a small dose of wine was given after each dose.
Brit. Med. Journal
Sept. 27th 1849.
With reference to this report of W. Sullivan in the "Medical and Surgical Reporter" of Dec. 12, 1886, which contains the following: "Last week 52 children died in Brooklyn of diphtheria. Lately reports of similar mortality have come from other quarters. It is our duty to call the especial attention of American physicians to the extraordinary success which is now reported in Germany in this disease from the use of Pilocarpine. It is given in ordinary doses intravenously to a large h. 60 cases have been reported by different physicians, wherein the results were astonishingly good ... We particularly request our readers to try this treatment and report their results whether good or bad."

There is a leading article in the British Med. Journal, entitled "Pilocarpine as an oxytocic," in which the results obtained by various workers with this drug are criticised, and the conclusion arrived at that whatever the merits of the drug may be, it is certainly held an oxytocic.

W. Hyman also gave the drug to pregnant rabbits, with no symptoms of labor ensuing.
Feb. 1849.

Gazetta Med. Italiana delle
Provincie Venete.

Radicin i. 1649. P. 374.
In preparing the drug the animals were rendered insensitive. He first gave the drug to 2 pregnant women: in the first case labor ensued, but she had previously been treated with warm enemas and hot baths. In the case of the 2nd woman, the action of the drug on the skin, salivary & lacrimal glands was most marked but no labor ensued. The injection was repeated 2d without result.

Dr. Kleinwachtzen after 3 injections on 3 successive days succeeded in inducing labor. The patient recovered.

Mrs. Clay of Birmingham gave injections, but by the 4th day the 72 was very large, a halfpenny and still rigid. Barnes's bags were then used and a living child delivered with forceps.

Cases of failure to induce labor by means of this drug are reported by Parisi of Verona, by Bergesio, and by Dr. Buzzi of Milan.

After a long trial Dr. Roux has come to the conclusion that Pilocarpine increases the strength of the pains in labor but is incapable of originating them.

In a case of contracted pelvic cavity,
where I was obliged last year to resort to cran- 
dolongy to effect delivery, I attempted this 
year, in the month of February, to induce prem- 
ature labor at 7½ months by means of Pri-
ocarpine. The first day I injected 2 m. of the 
2 percent lot I, which was only followed by 
salivation which continued 4 or 5 hours and 
profuse sweating which continued all night. 
No uterine pain was felt. The next day I 
 injected 10 m. of the solution which was followed 
by profuse salivation and slight uterine pains. 
These, however, only lasted about the hour I 
had no effect on the 7½. The next day, no sign 
of labor appearing, I did not feel justified 
in prolonging the suspense of the patient & ac-
cordingly resorted to mechanical means for the 
induction of premature labor with immediate 
success.

At the International Congress of Medical 
Science at Amsterdam in 1879, S. Vander V. 
read a paper on the physiological action of Pri-
ocarpine on the pregnant uterus and his 
conclusions were as follows.

1. That the subcutaneous injection of a Local

Pilocarpine excites the pregant uterus to contract, and if given in the first stage of labor it stimulates the uterine contractions.

2. Irrelevant. 3. It has been proved by clinical experience and experiments on animals that the action of Pilocarpine in inducing premature labor has been exaggerated.

4. If combined with the mechanical means for the induction of premature labor it may be found useful.

5. In normal labor where the uterine contractions are too strong, it may be used to dilate the cervix.

6. It must not be used to arrest Puerperal Hemorrhage.

Mr. Macan in reviewing the progress of this disorder mentions cases where Pilocarpine seemed to induce premature labor. In one of these cases, 3 grains of Pilocarpine subcutaneously, and a similar dose repeated in 6 hours, seemed to produce the desired effect. He also used the drug in cases of uterine amenorrhea, after delivery, where the puerperium were too prompt, but in only 3 out of 9 such cases did any good result follow. He therefore concludes...
Bid Med. Forn at Aug. 1799
that the drug is worth help in cases of toxic cochine.

In uraemia and especially in its convulsive manifestations, Pilocarpine has been proved as a remedy of great value, and it will appear that it is now taking an established position in the treatment of this condition both in this country and on the continent.

The first case of this nature which I have found recorded is in a German paper, and was treated by R. Braun. The convulsions lasted 1 hour after the birth of the child and continued uninterrupted for 24 hours when the patient's condition became hopeless: the patient was even comatose during the intervals between the attacks. Despite of large doses of Chloral by the mouth, & a subcutaneous injection of morphia, the convulsions continued. R. Braun injected 3 centi-grains of the hemiure of Pilocarpine about 30 hours after delivery: intense perspiration & sweating followed and slight twitchings of the facial & eye muscles. No more fits occurred & recovery was complete.
Brit. Med. Journal
April 2nd/11. Page 511.
by T. Hamilton, R.N.E.E. Chester.
The following case, which occurred recently, is illustrative of the value of this drug in such cases. M. T. C. aged 22, a student, previously healthy, was suddenly seized with convulsions. When first seen she was in violent general convulsions which had continued for 2 hours. On examination she was found to be in the 6th or 7th month of pregnancy; the uterus was rigid and indurated, the urine was loaded with albumen. Fifteen minims of the 2 per cent. 1/10 of Pith were injected, 6 hours from the first seizure. In 2 minutes very profuse perspiration and salivation ensued, the convulsions ceased and strong uterine contractions established. After the interval of 1 hour, she had 7 fits in quick succession: a 2nd dose of Pith was given 2 hours after the first dose. The salivation which ensued on the 2nd dose was to profuse as to threaten suffocation: although the convulsions became weaker & less frequent the breathing was so quick & labored as to make recovery almost hopeless. Pains, however, became stronger & more frequent: the foetus was expelled in 10 hours after the last injection. Patient remained unconscious for 2 days & then recov.
creased rapidly. This case is similar in many points to the last case I shall record which occurred in my own practice in December 1850. It is worthy of remark that immediately after the first dose in this last case the convulsions ceased, and that they began again in about an hour, i.e. just as the physiological action of the drug had ceased to tell on the patient.

On the morning of the 22nd Dec. last I was called to see a young woman about 20. I found her apparently dying, convulsed, and struggling at the mouth and nose. She was said to be in the 7th week of pregnancy, and on vaginal examination I found that the first stage of labor had begun. Just after I had entered the room a violent convulsion occurred. I was informed that at 6:30 A.M. she had complained of a violent pain in the head. This at 7 A.M. she became unconscious and had since remained so. At 7:45 convulsions set in and had since occurred every few minutes. Having the tincture of Phosphorus with me I at once injected 10 minutes into the left forearm. This was at 9:50. At 9:55 a convolution oc-
curred, so that in this case the drug had no other effect than one arresting the convulsions, as in the 2 cases already recorded.

10. 0 clock. Saliva & large mucus was kept contained especially for 1/2 an hour at least.

10. 15. Convulsion. Pulse 120.

10. 15. Convulsion

10. 18. Convulsion. Catherer passed but no water was in the bladder. It was later on found to be loaded with albumen.


After this the condition of the patient gradually improved, and dilatation of the bladder by means of Barrow's bag was begun and continued all day.

12. Patient lay up and altered about her as if intoxicated, breathing no longer quickly, conjunctiva sensitive.


14. 30. Urine passed freely.

14. 45. Pulse 138; states that she is sleepy.
After this patient's condition remained much the same till midnight when came again let in. He was in agony that he attempted to swallow but he made but 3:30 a.m. when I extracted a dead child with forceps. Here was no hemorragh but the placenta was found firmly adherent to the uterine wall, and was with difficulty removed piece meal. This was followed by no hemorragh either. Her condition now seemed desperate: breathing labored and absolute coma. Accordingly again gave a full dose of Pilocarpin which had the pleasing effect of rousing the patient from which ensued a hopeless lethargy. She regained sensibility and took some nourishment. The breathing however remained stertorous and acute trachea is let in: pulse 129 kept up at 120: the temp. at 1 P.M. was 96. Patient died at 9 P.M. thus surviving the delivery about 18 hours.

Though the issue was fatal in this case I am satisfied that the drug was of the highest value each time I gave it, a return to consciousness occurring after each dose. I am
induced to think that had it been possible to
effect delivery at an earlier period, the patient
would have been saved much exhaustion, and the
chances of recovery would have been thereby enhanced.

A curious point in connection with the
use of Pilocarpine is related by H. Galabin,
April. Doctor. Physician to Guy's Hospital; this
may be here en passant though there is
no reference to uremic in the case. H. Galabin
was called to see a case of labor, accompanied
by convulsions of an epileptic nature; they were
not of a uremic origin as there was no albumen
in the urine. H.G. gave half a grain of Pilo-
carpine by the mouth: no salivation following, a
2d and again a 3d similar dose was given at
intervals of 20 minutes. Shortly after the 3d
dose the full physiological effects were pro-
duced of salivation, tearing, and vomiting.
It was now found necessary to resort to forcible
digital dilatation of the 00 preparatory to
applying forceps. Chloroform was accordingly ad-
mministered, and before complete anesthesia
had been produced, it was found that the
Pulse, which previously to the Chloroform, had been about 90, full, strong & regular, had come up to 180 and was very weak & irregular. The patient being evidently in danger, the Chloroform was stopped, when on the return of consciousness the pulse fell to 90 and was good & regular. Again Chloroform was given in order to test whether the alarming symptoms were due to its use, and again the pulse rose, on this occasion to at least 200. Again it fell to 90 on the Chloroform being discontinued.

Patient was delivered safely and recovered well.

In this case it may be remarked that no explosive effect was produced by the Pilocarp, though its full physiological effects were apparent, but good results followed from its use in that no convulsion occurred after its first administration, previous to which they were occurring continuously.

The chief witness of the case, however, turns on the alarming condition produced by the combined effects of Chloroform & Pilocarp.

I have ascertained from Dr. Galbraith that he has had, again and experience of this
March 15 1879
Page 135

extraordinary effect of the combination of these 2 drugs, no are any similar cases on record. At
the conclusion of his paper Dr. Saladin remarks that "the case appears to suggest that there may
be an inconvenience in treating puerperal eclampsia
by Pilocarp, when it is likely that an anesthetics
will soon afterwards be called for in order to ter-
minate the delivery."

Two cases of Puerperal Eclampsia treated
with Pilocarp were recorded by Dr. Proshvarick of
Hamburg. In the case, severe convulsions set in
the 9th day before the expected end of pregnancy.
There was no interval of consciousness between the
1st and 2nd convulsion. The injection of 6 grains of
Pilocarp was followed in 3 hours by profuse sweating & regular lateral pains. After
9 hours convulsions were again threatening, when
the same dose was given it was almost immedi-
ately followed by a convulsion. In 24 hours
she was again sweating and in 1/2 hours re-
gained consciousness. Labor meanwhile had
progressed rapidly & child was safely born.
In another case of Puerperal convulsions,
where there was hectic contraction of the uterus causing retained placenta, which could not be removed even though the patient was bled out (I suppose with chloroform). The subcutaneous injection of Pitocin had the effect of at once relaxing the uterus, and allowing of the easy removal of the placenta.

Dr. Proctor next concludes that he prefers Pitocin to chloroform in the treatment of Perforal eclampsia, as it is more likely to cause regular action of the uterus, and, consequently, the more rapid delivery with the minimum of danger to the child.

The following case of Perinatal septicemia, which occurred in my own practice this year, is interesting as showing that Pitocin is powerless to reduce the temperature of septic poisoning. Mrs. D., aged 28, while in labour, her hand was found to be suffering from oedema of lower limbs, eyelids and hands. The urine was highly albuminous. Apart from pregnancy, which was found to be double, no exciting cause of kidney disease was ascertained. During labor, which was tedious,
I was prepared for convulsions, but none occurred. I gave chloroform and delivered with forceps: a 2"-head presented and again I used the forceps.

There was no laborion of the parts. During the next few days she did fairly well but on the 7th day I found her very uneasy: albumen was still copious, about 1/2: diarrhea was present. She had headache, was giddy, had a feeling of turning in the head. She imagined that the room had turned upside down and other illusions: she was stupid and irritable: lochiae were scanty, pale and ochrid: no uterine tenderness on pressure. She was evidently in a critical condition suffering from haemorrhage and lepraemia.

At 11:20. Temp. was 105-5. P. 152.

11:25. 10 ml. of Emetin of Pilocarpine injected.


11:45. Temp. 105. P. 148. Salivation much worse. As also breathing: says that she can cough much easier.

5:5. Temp 105-1. P. 156

I did not see this patient again on this day: I was disappointed that such a free diaphresis
was not followed by a decided reduction of temperature, as in other cases of hyperpyrexia, nor did the patient recover, it is usual to see a free diaphoresis at once followed by a fall of temperature.

Next day she was much the same.

12:45. 8 m. of Pilocarp. 1/2 tab. injected.
12:50. Salivation began & continued for 1 hour.

Here again, though the physiological action of the drug was most manifest, no reduction in temperature was obtained. I therefore abandoned the further use of the drug & with Quinine succeeded in reducing the temp. to 103°.8. This improvement was only temporary and patient ultimately broke with a temp. of 107.6°.

I am at a loss to account for the septic element in this case, (anemia alone would not surely have been accompanied by such hyperpyrexia), as antiseptics were used during delivery, her had I met with any similar case in my practice for many 3 years prior to this. I have had no more such cases since.
Le Profès Médical.
Oct. 25. in 1879.
and listed in Practitioners I/80 P. 129

Glasgow Med. Journal Vol. XI
No. 4 1879
Paying how from Puerperal encepha, he have to notice the employment of Pilocarpine in ordinary cases of Bright's disease and especially in post-partulal cases. I shall first notice a few cases of such which I have found on record, and then remark on some cases of my own.

Mr. T. even read before the Historical Soc. of Paris the case of a girl aged 16, who suffered from albuminuria and was suddenly seized with convulsions accompanied by copious albuminuria. The tincture of Pilocarpine was injected subcutaneously, the 3rd injection alone having any effect. The patient, neither convulsions was now capable of being caused; persipid, and salivation were prostracy. The convulsions entirely ceased after the 4th injection and the patient was cured.

In an ordinary case of acute inflammatory Bright's disease, under the care of Mr. McCall Anderson, daily injections of 4 of a tincture of Pilocarpine were given for some time. Marked lowering of the blood pressure, profuse perspiration and salivation lasting almost 1/2 an
Post Med. Chirurg. Opera 1679
Medical Record May 15, 1679
Practitiores II. 1679. Page 130
were the result. Patient made a perfect recovery, the albumen entirely disappearing from the urine, as distinct improvement had begun before the drug was resolved to, it was uncertain how far it contributed to the patient's recovery. No other medicines were given.

Dr. W. H. J. presents the results of the empirical treatment of Pilocarpin in 14 cases of post scarlet fever with general emphysema. In 11 of these cases extensive bronchitis was present. In 2, staphylococcal phrenia; and in 1, left-sided pneumonia. In each case the result was favorable: a 1 per cent. sol. was used for children under 4 years; and a 2 per cent. sol. for children above 4 years. In such young patients where collapse seemed to threaten from prolonged illness, 4 or 5 minutes of ether were added to the sol. in the syringe. When this was done there was never harseness, hiccup, sleep, or a feeble pulse. The injections were made once daily in the upper arm. The duration of the perspiration varied, in 1 case, 1½ hours, in another 3½ hours. In several cases the temp. fell rapidly after
The injection, but this fall, with one exception, did not last longer than 3 hours. Almost all the children coughed much after the injection. There was no marked increase in the quantity of urine passed after the injection. Dr. Knox draws the following conclusions:

1. Pilocarp has proved to be a very successful remedy for children who suffer from whooping cough and scarlatina.

2. A giving it to children can start the latter to begin at first with small doses, which may later on be gradually increased.

3. If the patients are very weak and likely to collapse after the injection, a few drops of ether or ice be added to the Pilocarp 20 or 30.

4. The drug produces a very conspicuous lasting secretion of sweat, such as no other drug has ever been known to call forth. Dr. acts quietly.

5. In cases of bronchitis, complicated by croup, which often produces dyspnoea in children, the affection of the bronchi vanishes very soon after the remedy has been administered.
Dublin Journal of Med. Science
March 1881. Page 244.

(from Jahrbuch für Kinderheilkunde Sep. 2. 1880
and New York Med. Record Dec 1880)

\[(0.002 - 0.02)\]
Dr. Thorne's Note: From the study of 11 cases of Uraemia in children, all treated by the subcutaneous injection of Bichocarpine, remarks that its action is characterized by active cardiac stimulation, redness of the face, profuse perspiration which begins on the forehead, upper lip and chin and gradually extends over the whole body. These symptoms appear in from 3-5 minutes after the subcutaneous injection of the drug: profuse salivation accompanies the diaphoresis. In infants this diaphoresis action is the more reliable of the two symptoms. The heart is affected only in so far as the hypotension from the sweating cutaneous surface produces a slight secondary lowering. The single dose of the drug is from $\frac{1}{32}$ to $\frac{1}{8}$ of a grain. The children as a rule complain of severe nausea & frequently vomit. Conditions of slight collapse are sometimes noticed. The following resume of references is appended.

1. The Urect? of Uraemia by hypodermic use of Bichocarpine. While of satisfactory results. It appears advisable to resort to this from a 1st or 2nd attack as soon as headache, an irregular
Medical Examiner July 16th, 1876.
Mackinac II, 178, D. 448.
1. The contra indications for its employment are, the presence of grave complications, abdominal weakness or general autonomic atrophy.

2. It appears that in glomerular nephritis, Pilocarpus fails to produce a beneficial effect. As this variety of Bright's disease cannot be differentiated from other forms by our present methods of examination, this condition cannot of course be dealt with like the contra indications.

4. In addition to the diaphoretic action of the muria of Pilocarpus, a direct influence on the renal vessels appears to exist.

Rapier's summary of Bern records the use of Pilocarpus in 33 cases of children's diseases, 18 of these were desquamative nephritis with diabetes after scarlatina, 3 the same after diphtheria. The remaining cases were vascular heart affections, thermal and acute affections. The ages varied from 9 months to 12 years: 3 to 7 minutes sufficed for the effect of the drug were produced. This perspiration goes on increasing for
Prachtkoer II. 178. P. 132
15 minutes. Then remains at its height for 1/2 an hour or more. Then gradually subsides. There is slight diminution of temperature. Pulse increases in volume & frequency by from 20-60 beats. As a result of its full effect there was a loss of weight of 120 to 675 grammes. Diuresis was only occasionally observed. Watery diarrhoea occurred in 2 cases.

The drug was always given but unaccompanied by a special diet. It was used once the dose given was
under 2 years about 1/3 of a grain
from 2 - 6 ... 1/10 - 1/7 ...
7 - 12 ... 1/4 of a grain for the first dose, and later on 1/5 to 1/3 grain according to circumstances. As a rule only 1 injection was given daily. The drug was well borne except in 2 cases, in which there came on vomiting, lacrimation, faintness, yawning & several trembling of the legs. In children over 4 years the diarrhoea was here handled than the diaphoretic action, in children between 1 - 2 the reverse was the case. In most cases the diaphoretic action lasted longer than the diaphoresis. There was no effect produced on the heart.
I have seen several cases of post-lumbocisternal drip. Dr. By myself with Pitocainine, but of these I shall only refer to two.

Case 1


10 A.M. 7 m. of Pitocainine 1/10 injected.

10.10 Pulse drops to 116. Saliva at the lips.

10.20 Pulse down to 112

10.30 Pulse down to 96.

10.35 Vomited watery mucus. Feels much better. The patient 22 oz of urine in the 6 hours succeeding the injection and treated all right. He had no more convulsions & recovered perfectly.

Case 2

A. C. Dec. 8. Seen April 27th 81 in distinct urinary convulsions. These had set in about 2 hours before I saw patient and at my request found him twitching constantly & foaming at the mouth, conjunctiva hirsute, pupils dilated, pulse almost imperceptible. Help came at once gave 1/2 m. of Pitocainine. A calling again after 1 hour he was still in constant convulsions and the same dose was repeated.

Arch. Med. Journal
I. 178. P. 429
In 10 minutes after this 2nd dose the convulsions ceased and returned to more. Again in an hour a 3rd dose was given. The salivation and sweating were most excessive for 2 or 3 hours, & when I saw him in the evening he was able to speak on being roused and was lying quiet. He eventually recovered and is now fairly well.

In this case, which seemed hopeless, I proposed the use of the drug, which was apparently the means of saving the boy's life.

I have left from haemuria to consider the use of the drug in other hospital conditions. It is stated that when administered to diabetic patients, the amount of urine is diminished and the proportion of sugar eliminated remains the same. If this I have had to experience.

In Hydrophobia, Dr. Lindley Euliss has proposed the use of iatroandi as likely to relieve the distress caused by the extreme dryness of the mouth. This symptom indicates that an arrest of the secreting function of the salivary gland is among the herbid prodiges
Brd. Soc. Transact. 1876 Vol. I.
Page 273.
which go to make up this disease. The fact also
of the saliva being increased in flow in the
babies of the dog, the probable parent of the
hydrophobia of man, points to the supposition
that the salivary glands are largely concerned
in this disease; and probably they may be
the special channels through which the mor-
bid poison may be eliminated.

The idea is certainly well worthy of being
put into practice. I have ascertained from
D. Cottille that in such cases, treated in this
way, have been as yet recorded.

The effects of Pilocarpine on the Eye
have been studied by Dr. Galen of Paris,
D. Diamou of Nancy, D. H. W. Williams, D. Truburn
and D. Alexandria of Marseille, and others.

D. Galen of Paris considers that it causes
contraction of the Pupil, that it is as powerful
as eserine in this respect and less irritating. He
uses both the nitrate & the sulphate in solution.
He finds that Cherry Laurel leaves contain the
hydric properties of the drug better than distilled
water. He states that the solution must be
neutral.

Boston Med. & Surgical Journal
March 16th 1879.


Practitioner 1879. Vol. I. P. 60 & 458
(Klein Monatsschr. für Augenheilk. June 178.
& Carls f. med. uns. Nov. 2/78).
The results of Salpeter's are in the main confirmed by Dr. H.W. Williams of Harvard University. He states that in the treatment of Glaucoma by iridectomy, Pilocarpine produces left conjunctival irritation, left temporal orbital pain and loss of power of accommodation more than the sulphate of quinine, of which he has had large experience. Dr. Weber and Jaqueur, also, commend the use of Pilocarpine as an adjuvant in the treatment of Glaucoma by iridectomy.

In pure Pilocarpine, Dr. Albertoni finds both a hyposic and a hyperosmotic principle, the last is absent in the salts of Pilocarpine and in many kinds of Tabernanthe leaves. After instilling a one per cent solution of Pilocarpine into the eye, there is at first contraction of the pupil, lasting from 1-2 hours. This is followed by dilatation, which is the more pronounced of the 2 effects, and which may last from 20 to 60 hours according to the quantity absorbed.

Dr. Königshöfer found that the solution of Pilocarpine, applied locally caused considerable hyposis & slight accommodation. After subcutaneous injection, there was less hyposis & greater power of Accommodation.
Practitioner 1874. vol. ii.
Pages 210 ff.

Archives d'ophthalmologie
Novem. 1879.
In a pamphlet published at Marseilles in 1877, Dr. Alexandoff records the beneficial use of Pilocarpin in cases of rheumatic iritis, phlyctenular iritis, double rheumatic iritis, phlyctenular iridocyclitis, and phlyctenular choroiditis. He finds that it has an immediate action on the iris, (i.e., as a mydriatic, I suppose,) and that it acts more rapidly than ecarine. He finds it especially useful in diseases of the vitreous humour. In all cases, diarrhoea was experienced. No galactocele influence observed. Menstruation unaltered. In only 1 patient out of 39 was the urine increased in quantity. The pulse always rose immediately after the injection and then sank. The pupil became contracted. Pains and precordial pain were sometimes observed.

The most interesting reference I have found to this use of Pilocarpin in some diseases is in a paper by Dr. Diamont of Nantes. I have not as yet been able to trace it in any English Journal. The author, after attending to the losionary factory results of all treatments, without adopting for this affection the cases of detachment of the retina, states...
That he has obtained most encouraging results by the subcutaneous injections of Pilocarpine. He gives the details of 7 cases to treated, from which he derives the following conclusions.

1. It is an undoubted fact that detachment of the retina can be cured, nine a leg completely, by injections of Pilocarpine, methodically performed. This cannot be hereby the result of a fortunate sequence of events, or of mere coincidence. In 8 trials 7 were successful, while in my previous experience of more than 30 such cases, I had been with but 1 successful case.

2. Its application is of almost equal utility in all the varieties of detachment (hypoplasia, with or without sclero-chorioiditis, overwork, cold, &c).

3. Even when used in advanced cases it can be useful. My results were almost all good. It is evident that the sooner the treatment is adopted, the greater will be the chance of success.

4. The treatment has a rapid and prolonged action. All the cases were improving before the 10th injection...
Brit. Med. Journal
June & July 1880.
ially in these cases as a derivative: that the injections ought to be carried on so as to retain the patient as constantly as possible under the influence of the drug. They ought to be given daily for 10 to 15 days consecutively, according to the severity of the condition: a respite of 10 days after the injections have been given and the treatment again begun. The doses ought to be sufficiently large to cause a copious salivation of at least 1 hour's duration. In most cases he began with 6 dr. of a solution of 20 centigram. of nitrate of pilocarpine in 1 decimeter of distilled water. The injections were always given on the palm of the hand, while the patient was fasting and at least 1/2 hour before meals.

Pilocarpine is, how to my knowledge, the last place the employment of pilocarpine in cases of asthma. Attention was first drawn to this subject by Dr. H. B. Bennett, late assistant physician, City of London Hospital, in his lectures on "The Treatment of Asthma" published last year. Dr. Bennett gives the particulars of 5 cases so treated, where the paroxysms
were within a few minutes relieved by Picarposin. He explains that "the powerful respiration which Picarposin produces in the distribution of the blood must necessarily have a very beneficial influence in some forms of asthma, for by attracting a large volume of blood to the skin and subcutaneous vessels, and by diminishing its volume through the vigorous perspiration & salivation, the congested aternal organs are relieved in a corresponding degree." During the action of the drug the patient shall be recumbent: the almost immediate relief even will enable him to assume this position. In case II. Mr. A. the relief was so great that the night following the injection the patient was able to lie all night, the first time for many years.

Case III., a man of intemperate habits, showed all the signs of alarming collapse after the injection: the radials ceased to feel, there was cold clammy perspiration, & actual rattling was heard. The injection of the m. of Liqueur Alcapias at once restored him.

In all the cases the relief was due here largely to the suppression of the pain.
A M. J. L. 180 P. 961

Wernicke's \textit{Nerven Medizin} 1880.

In connection with this note also,

Case of Pneumonia cut that with Nitrate of

\textit{Black Med. Journal}

August 7th, 1880. Page 205.
The perception of the symptoms, led to the removal, as far as practicable, of its immediate and remote causes. The improvement lasted long after the effects of the drug had passed off, and in several instances it was almost complete.

In this paper Dr. Berks quotes the experience of Riebe in the use of Pilocarpine in chronic lung disease. "In the very obstrusive forms of centrilobular carcinoma, or the lungs, proceeding from cavities, which again & again return occasioned by fever, but occasionally without it, I have hitherto been a lasting benefit from the use of its called expectorants. Here Pilocarpine, 1/60 of a grain applied by subcutaneous injection, has rendered the best service."

It is satisfying to find the following confirmation of Dr. Berks's success in asthma. Mr. Ward in H.M. Prison Waterford, had been for long a sufferer to asthma, and was about to resign his position in despair when the publication of Dr. Berks's cases led Dr. Needham, the Surgeon to the prison, to try Pilocarpine, which was injected in doses of 3/4 a grain,
every day for a week: (a smaller dose was given the first 2 days). This had the effects of at once relieving the asthma, enabling the patient to sleep every night, and his whole night, and to resume his daily as before. His appearance was much improved and he was gaining in weight.

From a consideration of all I have read and experienced of the therapeutic uses of Pilocarpine, I venture to assert that it will take an established and lasting position among our remedial agents, and that it is deserving of admission to the next British Pharmacopoeia. I am now prescribing it freely both in hospital & private practice and have every reason to be satisfied with its results. The cases of Bradenia which I have detailed appear to specially indicative of its value, as also its use in Pericarditis Fissuring, in Asthma, and Diphtheria. I shall endeavour to test the drug in such cases, but while compiling this paper I have not had the opportunity of doing so.

Fins.