Hydatid Disease with special reference to its etiology and treatment.

The subject of Hydatid Disease is one of the greatest interest to Australian practitioners not only from the frequency with which the disease is met with, but also as regards the successful treatment for there is one method so applicable in all cases.

Since my return to Australia after being in practice in Great Britain for a short time I have been greatly surprised at the number of Hydatid to the seas and from all accounts the disease is evidently on the increase.

The etiology of the disease may be due to certain things and principally through the introduction of the worm with one food and drink.

Also may be the cause of the trouble when
There are often towns and reservoirs also in country districts where the water is clean and the dog, sheep and men drink from a common supply and thus the embryos gain an entrance to a susceptible host.

Raw vegetables which have been imperfectly washed may carry the disease to man.

The dog is practically the source of Hydatids and as the animal is in close contact with man the opportunities of infection are great.

Water is by far the most usual source of Hydatids and some even suggest that swallowing the dust of the cyst (as they are often excreted during the day on the towns here) may be the starting of the disease. If so, the case the capsule of the worm would have to be divided by the mouth and mixture of the lungs.

Sometimes on slaughtering men and sheep we find the Hydatids, but as a rule the cyst is not so large as in man and hence the reason of buying your meat thoroughly cooked.

The dog besides harboring may act as an intermediary host and we may find eggs on the back of the face, the mouth or the tongue and thus by biting some one's hand he may transmit the disease.

According to Sir Thomas A Country with many
sheep etc. The organs of which are often eaten raw by dogs, also the water supplies the country and ground from waterholes or dams (on the banks of which dogs may deposit the eggs to be blown in by the winds or washed in by the rains) and there be dogs in abundance we have all the conditions necessary for the spread of the disease.

In Australia dogs are very plentiful in fact besides what are kept off farms each shepherd is allowed to keep two or three to look after the sheep without paying the usual registration fee, so that everything is in favour of the spread of the condition.

The sheep and oxen are not infected by a Veterinary Surgeon and the carcass often contains multiple cysts and thus the dogs become reinfected.

Another common cause is the eating of water-cress obtained from the side of streams of water in the country and thus not thoroughly washed. With the result that the cysts are introduced into man.

For preventing this spread of Hydatid in various regulations have been considered but not enforced by the Government as yet — viz.

(1) Dogs shall not drink or swim in the same water supply as man and cattle.

(2) Faecal matter of dogs shall be burnt or tiboig water thrown over it.

(3) Dogs shall not be allowed to lick the hands of children.
The Liver

The Liver is by far the most common organ for the body attacked by Hydatid, and this can be accounted for by the ease with which the egg can reach it through the Portal System. The lungs are next in frequency to the Liver viz.

Liver 55 to 60 per cent., Lungs 10 to 15 per cent.

Generally we find a single cyst in the Liver, but often there may be two or three cysts. In the multiple form of Hydatid the Liver has usually one cyst, and the other organs as the Peritoneum, Omentum and Uterus may contain several.

For Hydatids of the Liver the usual signs are that we obtain an increase of abdominal distention, this is not always so, the cyst has a tense elastic feel, and on great exertion may rupture.

In many cases we get symptoms from pressure on the bile duct, and the motions are like olive clay.

In the lungs Hydatid may grow very large without causing any serious inconvenience. Hydatid of the Lung as a rule do not contain Daughter cysts, but they are by no means seldom found.

The cyst as found generally on the upper lobe of the Lung, and is bulky, slightly attached to the Lung tissue, and may be easily removed by respiratory
Physical Signs of Hydatids in the Lungs

Expiration

There is a deficiency of expansion of the lung on the affected side and the measurement is increased.

Pallor

Pallor often reveals an absence of vocal tremors.

Percussion

Over the cyst we obtain an absolute dull note.

Inspection

The absence of breath sounds, if the cyst has increased sufficiently to approach the chest wall.

If they chance there should be anything virtive between the chest and the cyst, the breathing may be of a tutior character.

The breathing just beyond the cyst may be normal or be simply inoral.

Suspension

Temperature normally normal.

There may be pronun on the bronch which gives rise to a constant irritable cough.

Diagnosis

Diagnosis is often very difficult, but the history and condition of the patient will give you a good sign.
In a cystic cyst, the diagnosis is easy as we have the characteristic symptom and the patient's history and the usual signs of Pneumonia. Any Cachexia, Clubbing of fingers and discoloration of nails. Sometimes there is a dry cough and dyspnea. Often, one may be haemoptysis before the rupture of the cyst.

Oleum

Hydatids in the Oleum have no extrastyle, the serum membrane taking its place, and cannot be distinguished from those in the Lung tissue.

Pentoneum

In the Pentoneum Hydatids occur as multiple cysts, the usual seats being the large and small stomata. As a rule the Hydatids are not larger than a walnut and vary in number from a very few to many dozens.

Brain

In the Brain the cyst is usually single and without an external covering. Often we find it coexists with the same disease in other organs such as the Liver and Lungs.
Symptoms

Symptoms usually are headache varying from extreme to mild, blindness, hemiplegia. Symptoms vary according to the position of the hydatid but often the frontal headache is very severe and persistent sometimes pounding. According to different authorities the blindness is nearly always present no matter the position of the cyst. Sometimes the patient becomes thick wadded or has had periods of blindness before. Pupil's dilated and insensitive to light.

Diagnosis

Diagnosis is difficult and three points have to be considered:

1. After closing the scalp feel for any thickening of the cranial bones.
2. Notice if any bulging of the cranial bones on the affected side.
3. Consider the age of the patient. Hydatid cysts are in young children also in adults, whilst tubercular growths common in children and cerebellum.

Spinal Cord

In the Spinal Cord Hydatidts are rare and as yet I have not seen a case it develops outside the columns and forces its way into the canal either by absorption of the dura mater or by widening the intervertebral foramina.
The Kidney

The kidney is the most common cyst that affects the kidney and may grow to a great size before the patient suffers any considerable inconvenience.

When it develops in the medullary tissue it seldom reaches a large size and as a rule remains quiet to the skin of the organ. The kidney grows slowly in the kidney, so that the skin has time to accommodate itself to necessities of life.

Kidneys attain the greatest size when they develop from the posterior, rarely do we find an kidney between the capsule and the organ.

Signs

The signs in two-thirds of the cases is easy as the cyst goes into the glands and few obtain symptoms similar to Renal Cyst. Very severe pain starting down back and thigh, vomiting, retention of urates with froth in urine. In these cases the swelling disappears gradually.

Kidney in the Cystic Capsule

Kidney in this situation vary case and as yet I have never seen a case...
Hydatid of the Oesophagus are frequent, sometimes confined to this organ alone but generally in liver and Pancreas also. On feeling it through the abdominal wall it produces a feeling of fulness and weight over the Oesophagus alone or mechanical pressure on the stomach.

Pancreas
Hydatid of Pancreas generally affected with other organs of the body.

Diagnosis
The diagnosis will depend on the size the cyst has attained and whether its function is interfered with or not by the Hydatids.

Bone
Hydatids by means of pressure force thin bone through bones of the skull and chest and pelvis. Sometimes an injury of the spine.

Spinal Cerebrospinal fluid by the pressure of the Hydatid.

Hydatids in the Heart
Hydatids rarely found in the heart and beyond a feeling of tightness nothing is observable.
Heart

Diagnosis is very difficult and in fact many of the cases recorded have not been diagnosed till after death.

Stomach and Appendages

Hydatids of the Stomach are rare and often really cases of Hydatiform Nile. Hydatoids of the Stomach only a few doubtful cases recorded.

Breast and Stilla

Hydatids in this position very rare.

Eye

Hydatids of the Eye have occasionally been observed and as a result we obtain a loss of sight. The orbit is more frequently found to be affected with the disease and there also the sight is lost and there is a deal of pain.

In Victoria Australia the sexes are attacked on the same proportion by Hydatid Disease as they occur on the total population.
Treatment

The Treatment of Hydatidosis has received a great deal of attention throughout Australia lately and much has been done in trying to adopt sounder principles in dealing with this increasing disease than formerly. From experience it has become evident that no one method of treatment will be successful in every case and therefore in dealing with Hydatidosis several conditions have to be considered viz.

(1) Locality of the Hydatidosis

The most frequent position of Hydatidosis are those within the thorax and abdomen. Hydatidosis and more particularly the Liver and Lungs. About 75% of the cases occur in the Abdominal Cavity and the most common organ affected being the Liver, the Lungs coming next. Sometimes it is impossible to diagnose the case and treatment is impossible, as when the cyst is situated in the walls of the Heart and occasionally in the Ventricles of the Brain. In the Lung we may have a spontaneous rupture into the Bronchial tubes and an expulsion of the parasite by coughing. Often faeces are conveyed to the lung passages where we have had a spontaneous rupture or in consequence of surgical interference and thus we obtain Intestinal
(1) Locality of Hydatids (continued)
Changes in the result.
From this cause we have cachexia, sweat, cough, fever etc.
And the patient presents all the effects of Pittiri.

Locality 1
In the Liver and Stomach, the Hydatids often interfere with the natural ducts.
The cyst on the liver may burst and bile may enter the one also the remnants of
the parasite and any daughter cysts present may pass into the bile ducts or may be arrested in them and cause jaundice.

Hydatids of the kidney are very liable to
suffocate spontaneously into the pelvis and thus get eliminated.

(2) Age of the Parasite
As the Cystome gets older it becomes tougher, more rigid and may undergo calcaneous degeneration. It may also
have a closer connection with neighboring organs as time goes on and thus it tends
easily collapses after removal of the contents.
If the one has undergone calcaneous degeneration at its birth to come away in small pieces
during the cure.
(3) Affirmation in the Sac

Affirmation in the sac or intraperitoneal changes in the contents generally necessitates affirmation in a radical operation and the prognosis in the sac also influenced.

--- Treatment ---

Electricity

Electricity has been tried repeatedly but as yet with no good results; in fact the cases in which it has done good have been due to the cyst being infibulated.

Medicated Injections

Intravenous and carbolic acid injections have been tried with unsatisfactory results in fact death has been caused in a few instances. Potassium Permanganate injections have occasionally been of some, but the benefit is generally due to the irritating demineralization.

Cauterize

One of the earliest methods was to apply cauterize till the surface of the sac was reached and sometimes an opening in the sac itself was formed, then the contents were removed and antiseptic injections to prevent any decomposition. A later method has
Cystitis (Continued)

In some cases, when an incision is made to a certain depth and then applying caustics to the floor of the wound, and in a great many cases the sac was opened by means of an incision or by some other method. The reason for this application was to try and obtain adhesions between the sac and the bladder but this is entirely out of date now, as efficient adhesions could not be obtained and in addition it is very dangerous and the mortality is high.

Tapping

In Australia, this has been the recognized treatment until lately, but from statistics the number of reported successes by tapping are anything but satisfactory inasmuch as the cyst recur in many and become a cause of danger to the patient. Such a thing as escape of the cyst has been known to occur ten years after the tapping.

Although simple and harmless tapping may be, yet we often have alarming symptoms following, in fact in some cases death has taken place. There have been cases of death resulted when the cyst in the liver and lungs have been tapped and in these cases death was judged due to shock.
(continued)

Death has taken place in the lungs from tapping and this time it was due to the lodging of the bronchial tubes of both lungs.

Often after puncturing the cyst of the liver one of the alarming symptoms due to the contents escaping down the oesophagus into the Bladder alsoPay may get blocking of the Bile ducts after tapping a cyst in the liver and as a result one Piece jaundice.

From various statistics I have found that after tapping death has taken place in 19 per cent, and in 46 per cent it failed to save the patient. In a great many cases supposed to be cured the patient had not been under treatment for an insufficient length of time to say that a permanent cure had been obtained.

One authority says "that the aspirating furnature shows only about half the ratio of death as compared with the furnature of the ordinary thorace," but as to the correctness of this I allow rather doubt.

The constant cases with the number of tapping. At present the furnature and tapping are never used in the case of pulmonary tubaritits as they cannot be dealt on account of their anatomical structures and the risks of flooding.

Never use a nodule more than 46 of an inch as a large nodule or act because leakage occurs to the large aperture it will cause and besides one may have inflammation as a consequence.
When tapping with large needles one is to obtain a Hydatid Cyst, for since we have adopted the cannula instrument there is not so much tendency to this eruption.

If the needle be of the small size and there is strict aseptic precautions there is no risk of suppuration. Another rule is never to tap where there is suppuration nor a daughter-cyst present. Only where there is a single cyst and thus on the lungs. If in doubt in the lungs of there is an Hydatid it would be better to incise at once, cut out part of rib and just on the needle and see what we have to deal with. In this operation there is less danger than putting a needle in at just without an incision. In tapping one cannot empty the daughter-cyst. Therefore it is impossible to say we have cured the Hydatid and as a consequence tapping will not often cure the patient.

Often after tapping the Hydatid lives even although there is no suppuration and as the Hydatid lives the capsule becomes thick and rigid and on returning to you some time later the Hydatid has undergone calcareous degeneration and a cure is more difficult to accomplish than if the incision had been done in the first instance.
The Mortality from Australian Statistics is less in Treating than from Tapping, so that your patient is less liable to die under the radical operation than tapping. Another danger of tapping is that you are liable to sometime a blood vessel or important organ, and besides you may cause rupture of the cyst and leakage etc.

I am convinced of tapping I find it often false absolutely in a large number of cases of Hydatid cyst, whereas in the radical operation the entire parasite is removed and no danger of further recurrence.

Tapping is at present looked upon as entirely unreliable, and has been given up except as a diagnostic aid at the time of performing the radical operation.

<table>
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<th>Summary of the results of Tappings reported in 1889-90</th>
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<td>Death</td>
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<td>Mortality</td>
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<tr>
<td>Unsuccessful outcomes</td>
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- Total failures of puncture 45.91 per cent
- Relieved | 14.57 per cent
- Repeated Cases | 39.56
- Total successes of puncture | 34.07 per cent
Treatment (Continued)
The treatment of Hydatid Cyst by direct incision and suturing the cyst wall to the fascia (Lindemann's) besides this method of closing the one after the removal of the Hydatid and returning it to its previous position again (Bonds) are by far the most successful at present of all operations.

Simon's operation is now out of date, but it is based upon as a developmental stage on the surgical treatment of Hydatid, which has become greatly improved by Lindemann and Bond.

Simon's Method
Simon's method of operation was to make a small fine trochar and cannula into the most prominent part of the tumor then he withheld the trochar to make certain of his diagnosis and if it were satisfactory he introduced a second trochar and catheter of a large size at a little distance from the first one. After this he allowed a little of the fluid to escape and then he plugged both cannula with carbonized wax and applied antiseptic dressings. Patient was kept in bed and dressings removed now and then to see if suppuration had taken place.
TREATMENT (Continued)

If suppuration be known that inflammatory adhesions had taken place and be completed the operation by an incision down between the cunlei onto the cyst and remov the gauzae.

Simon did this operation only in cases where the tumor had attained a large size or in cases of suppuration.

Against Simon's operation it is found to be very fatal, and uncertain on the one of January adhesions, the latter of which is the most important term in the method advanced by him.

Mortality in this operation has not been even as high as 4 or 5 per cent.

Pothmann's Operation

Pothmann's operation is another method by which adhesions between the foyettes and the one Pothmann are sought for.

An incision is made down to the junctura or even through it, the wound is then flushed with gasoline etc until irritation and inflammation are set up and we obtain adhesions. After a week the cyst is opened with a knife and treatment after this is the same as in Lindemann's operation described later on.

Against Pothmann's operation we have the shok of two operations and we cannot defend of the adhesions. Mortality on this method has been stated as 19 per cent.
Abdominal Hydatiditis

Lindemann's Operation

In the case of Abdominal Hydatiditis after the usual antiseptic precautions an oblique incision is made down to the peritoneum, then all bleeding is arrested by force of pressure or ligature. After which the peritoneum is then carefully opened to a similar extent as the visceral layers and if we have gone directly down on to the peritoneum the sac will appear. If, however, we might go down on to a portion of the intestine or omentum, occasionally where any operation has taken place the sac being adherent to the peritoneum.

If the latter be not the case we pass a curved needle with a sterile silex or catgut through the sac well parallel to the loops of the small intestine. The needle may be threaded either before or after having passed it through the sac.

On the drawing of the silex and silk etc. care is required to prevent the escape of fluid especially when it is permeant, and this is accomplished by drawing the sac up the wound by the loop of silk or catgut and fastening round with crosses. First the cyst with a knife and forceps, insert the finger and attach the sac further to the external opening, so as to accurately unite them with the small with a catgut.
Sederman's
Operation

Sederman's

Treatment (continued)

Some surgeons include the skin as well as the peritoneum, connective layers and fascia; others prefer to leave out the skin when attaching the one to the abdominal opening, owing to the amount of irritation caused by including it, but this is counterbalanced by the greater hold we obtain. As a rule, the irritation soon subsides after the removal of the stitches, and they are at no

suffer to include the skin.

When the one has been safely attached, the contents should be thoroughly cleansed as even a small piece of the cyst wall cause a continuous discharge.

After the fluid has been drained away, the inner cyst should be removed by forceps, which have broad fenestrated blades and cut on parallel lines, so as to obtain a flat side and gentle hold. You should be careful on removing the inner cyst, that it is

not torn.

The daughter or any thing that is left behind should be removed by sucking out the same with some antiseptic fluid by means of a

Grainger

A long drainage tube is then inserted into the wound and the patient turned on his side to allow the fluid to drain away, and may be left on.
Treatment (continued)

Contiguous dressing are used and if the case is thoroughly cleaned out at the operation then it is not smart disposal.

Indemann's

A daily dressing is used for the first few days and if the case proceeds favourably there is no suppuration from the case, although there might be a little from the tips of the wound. The stitches may be removed in 5 to 7 days. In Indemann's operation suppuration of the case is not an essential as in Perman's but on the contrary it is accidental if it does occur.

Summary of the results of Indemann's

Summary Operation on Hydatids of the Liver reported 4 Patients a few years back

Abdominal Hydatidoi

Deaths 7 or 10 29 per cent

Recoveries 61 or 89 70 per cent

Total Cases 68 99 99

It is that there was only seven deaths on sixty-eight cases.

In another lot of statistics there was only two deaths in thirty-two cases operation by Indemann's method.

Indemann's operation on Hydatidos treated through the chest will see next page
Lindemann's Operation

Lindemann's Operation for Abdominal Hydatid.

An incision three inches long is made over the central part of the tumour, and all the superficial tissues are divided. Then the sites are exposed and for such as two inches of one site or more of sites required are excised and the peritoneum being firmly stripped off by an elevator.

The gland should not be opened till the piece of it is removed and all being stripped. The cyst can be seen as a hole attaining its junction with the movement of resolution.
Treatment (continued)

Sometimes a fine trochar is passed into the cyst through the skin to make certain of the diagnosis.
If this is unsatisfactory a curved needle is passed through the skin and one end into the interior of the parasite and brought out to include two tenths of the sac wall. The needle is then threaded of and done previously with strong catgut and silk catgut, which is drawn through by the withdrawal of the needle. A similar loop of silk or catgut is passed and thus the cyst wall is securely held during the operation. The sac is fully opened and two fingers of the operator then inserted and the sac is attached to the external opening by the nodal silk or catgut or silver wire.

The remaining fluid and solid contents are then removed by the fingers and groups beside the anterior of the sac is drawn out. A drainage tube is inserted and the general antiseptic dressings are employed. Some case, injections to wash out the sac but it is objectionable as it is oft to set up a cough by the wind getting into the tracheal tubes.

The results are poor and as the patient regains strength cough and pyogenic malleus failure may be due to incomplete drainage or a false of membrane left behind.
The most favorable result one can obtain is to confine the treatment to the immediate cases, for about 3
of the cases recover

If there is a hydatid cyst in the liver, it is necessary to remove the cyst towards the gallbladder. In some cases, the cysts may be removed and the operation is repeated. In one case, the cyst was removed and the operation was repeated.

The result of the operation was favorable, and the patient recovered. The operation was performed with success, and the patient made a good recovery.

Summary of Hydatids treated by Hydatid.

Table: History of tuberculous disease in the lungs. In the lungs, 1 case. In the chest, 1 case.

Failure principally due to the case not being completely treated by resection and drainage. These cases have been sufficient.
Bond's Interparietal Treatment of the Hydrocele Cyst
By this method one gets rid of three disadvantages of Lindemann's Operation
1. A bad scar and risk afterwards of hernia
2. Prolonged discharge of bile and a tedious recovery
3. Infection through an open wound.
Unfortunately, this method cannot be applied to all cysts, not even to those confining the
liver from their large size or their position which prevents them from being properly exposed.
Bond exposes the hydrocele by laparotomy. Just the same way as Lindemann does by opening the
abdomen and getting rid of the contents.
After washing out the cyst cavity with some
antiseptic, you close the wound as securely as
possible so that there will be no leakage into
the abdomen and return the case again to
its former position.
As a rule, there is no risk of leakage if the
opening in the case is exactly opposite the
abdominal incision.
The external opening is then closed with
the usual antiseptic preparations.
This method of Bond's is the only possible
treatment in the case of hydroceles of the
Brain, where the ventriculo-peritoneal
drains away in the other methods and
death has probably been the result of this.
Treatment (Continued)

Dr. Hamilton Russell has introduced a modification
of Dr. Bond's method of intraperitoneal treatment in
that he returns the empty case without suturing it.
There is no risk of leakage in cases otherwise
regarded suitable for the intraperitoneal method.

If the opening in the case is made directly opposite
the abdominal incision,
If the cyst should enlarge to its former size then
we have the incision in it directly opposite to
the abdominal opening, and should we have to go
into the cyst again all that is required is to
pass a pair of dressing forces through the
Abdominal wound.

In the closure of the case we have an easy method of
 arresting hemorrage which we have used in Russell's modification.

Summary of the Mortality of the Radical Operations

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<tr>
<td>Bond's Intraperitoneal Treatment</td>
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John Widdell Richards

15th March 1897