A Clinical Study

of

HYDATID DISEASE

by

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A CLINICAL STUDY OF HYDATID DISEASE

The presence of Hydatid Disease in the human subject has been noticed in every country where the dog, the chief host of the *Taenia Echinococcus*, and man, have come into anything like close personal relationship.

The inhabitants of Iceland, and Australia, however are so strikingly the Victims of the ravages of this disorder as compared with the number of cases recorded in other parts of the Globe, that the affection is practically limited as 'endemic' to these two Countries.
Among the writings of Hippocrates, \((\text{aphorismos Sect. 7 No 55})\) reference is made to a form of tumour in the liver which might reasonably be interpreted as implying a knowledge of the existence at that early time, of a fluid swelling which very closely resembles the schistoceccus in that organ.

"Quibus hepar aqua plenum in omentum erupit, his ventre aqua repletur et morientur."

In 1766, Pallas first recognised the Taenia Schistoceccus as a separate living creature, and in 1782 Pasteur Pize first pointed out that the scoleces were really tape-worm heads. (Ziemmna Vol III)
In 1821 Bremer was the first to discover Scolices in hydrated tissue from the human subject, and Bright who was the earliest of the English Physicians to recognise them, recorded a drawing of them in Puys Hospital reports for 1837. (Hilton Fagge practice of Medicine Vol. 11.)

According to the same Author the term Sclimosoccus (Σκίνας = Hedgehog and Σκοκκος = Plain or Berry) originally invented by Rudolphi has been used in England to designate the Scolis or head. While the German Writers make use of the term to imply the whole animal with its daughter Cells brood Capsules and scolies.

The idea among some of the early investigators that there were several
Distinct species of *B. clematidis* lead to the introduction of different names which even now are frequently made use of:

Thus Rudolph ( JR. med. parasites of man p. 588 ) accepted two species, *B. clematidis hominis* and *B. clematidis veterinorum*, the former containing daughter bladder, and found in man, while the latter was quite simple and found in the herbivora.

Kichenmeister ( parasitism p. 139 ) supported this idea, but changed the names of *B. clematidis hominis* and *B. clematidis veterinorum*, into *B. altriciparanum* and *B. scoleciparum*, respectively, supporting his opinion on the ground that there was a distinct difference in the number and form of structure in the hooks of each species.

To find the simple cyst in the
human subject, is a matter of the commonest occurrence, while on the other hand, the presence of daughter cysts in hydatids in the Ox, Pig, Kangaroo, and other animals is frequently met with.

Leuckart (loc. cit. p. 583) has clearly shown the error of supposing the existence of two distinct species, by demonstrating that the helmincoceus hooks exhibit no form of difference, except what is to be noticed in the transformation of the rudimentary head into the segmented tape worm.

Küchenmeister in the later edition of his work (p. 162) concedes the fact that the different forms of helmincocei are but varieties of the same species.

The failure to find heads in some
hydatid tumours, lead Laennec [Reckart loc. cit. p. 584] to regard these bladders as special animal organisms, to which he applied the term Acephalous. The animal nature of them was even denied by Rudolphi, Blumenbach, Hensinger, and for a while by Buchenmeister (Reckart p. 585) until Reckart's demonstration of the Chitinous nature of the bladder wall, placed it beyond a doubt.

These so-called Acephalous are the Commonest forms of hydatid met with in the human subject, they are nearly always of this kind, when situated in the locality of the brain, Reckart compares them to the trees which never bear flowers, or fruit, and like Sterile plants whose sterility depends on the conditions
under which they live.

_**Taenia echinococcus**_

They are found in the upper portion of the small intestine of the dog, between the villi, in great numbers. Panceri found it in the Egyptian Jackal, and Gotfurd in the Wolf (Heuckeart p. 592). The Cat, the Rabbit, and the Fox have been frequently experimented with, but there is no positive evidence of its being reared in these Animals. Kuchenmeister is of opinion that man himself may be the presumptive host of the Taenia, but there has been no proof whatever furnished of his hypothesis, while the opportunities for their development in man are very
numerous, from the tendency of the hydatid Cyst in many Cases to open into the Alimentary Canal, and the frequent swallowing of the Cyst contents that constantly takes place in expectorating the hydatid contents from the lung. The milky-white appearance of their proglottides renders them visible to the naked eye. When the intestine is warm they exhibit lively movements, shortening and elongating themselves like leeches. Under the Microscope they are readily recognised by the narrow character of their head and neck, and the number of their proglottides, and especially the last one which is equal in length to the others together.

Unlike the development of the
Bladder stage, the metamorphosis from the Scolecis into the adult Taeniae takes place with great rapidity. Von Siebold (Heuckart \( p.\ 591 \)) found 15 to 20 days after feeding, a two jointed body in the worm, and according to Heuckart, who made observations after the same length of time, the majority of the Taeniae were still unsegmented, though some distinctly were so.

Von Beneden (Heuckart loc. cit. \( p.\ 592 \)) found mature Taeniae four weeks after feeding, and Kuchenmeister not for eight weeks, Heuckart at the seventieth week, and Henke eleven weeks after found them developed in size, but still without eggs.

The length of time that the worm
lives is still undetermined, Siebold supposed that it did not survive two months, but points out that it is against all analogy to suppose that the productivity of the worm is exhausted after the one or two pro flottides, besides that, the form and thickness of the hooks suggest a greater age, and the analogy is further strengthened by the fact that the worm is found much more frequently in the older animals.

The proportion of dogs infected with this parasite in Iceland and Australia is very large. Kratke observed it in Iceland in 28 out of 100 Cases. In Denmark on the other hand it was only found twice
in 317 Cases. (Heuckeart loc. cit. p. 592)

Thomas, South Australia (hydatid disease p. 1917) found it in 40 percent of the unregistered dogs.

I have observed in several cases of stray dogs where the alimentary tract seemed to be infected with thousands of round worms that there was an entire absence of the \textit{Taenia Solium}.

In the case of a Scotch terrier whose abdominal cavity I had three months previously opened and filled with fresh hydatid fluid to test its effect on the peritoneum, I found the small intestine simply infested with mature \textit{Taenia Solium} containing ova, and
no trace whatever of any other form of round worm.

Lewering (Bericht über die Verte
inerwesen Sachens 1854 p. 87) is of opinion that when the dog is abundantly infested with the worm it sometimes occasions conditions where the external symptoms are like those of Hydrophobia. In the case of the dog, I had under careful observation where at the Post Mortem his intestine was found filled with the parasite, there was certainly nothing unusual to be noticed in his behaviour during life.

The dog practically must be regarded as the direct source of
of hydatid infection in man.
The disease itself must vary according to the number of dogs in the
Country, and on the opportunities
that exist for conveying the biva of
the Paenia to man, sheep, and cattle.

When it is considered that one
dog may be the means of con-
veying innumerable biva and
that it may keep constantly re-
infesting itself from herbivora
that it may have infected, it becomes
a serious danger when other con-
ditions favouring the propagation
of hydatid disease are present.
According to Thomas (hydatid disease)
there is one dog to every 3 or 5 of the
population in Iceland, and to
Cheevant-loc. cit. p. 639) 1 to every 11
persons. The Inhabitants are mainly engaged in the rearing of cattle. There is a great want of cleanliness among the people which is increased by the conditions of their life.

The dogs and cattle in many cases occupy the same rooms as themselves, and they even go so far as to let their dogs lick the very dishes they take their own food out of.

Hydatid disease is known in Iceland as the "hiver plague" and according to Schleicher, who was sent by the Danish Government to report on its cause, estimated the number of patients suffering from hydatid as 1/6 to 1/8 of the whole population. Among who
practised over an area compr-ising 1/4 part of the whole island considers the above figures too high, and estimated the disease at about 2% of the whole population. (Schackart, p. 638)

There is no accurate means of stating the numbers of dogs in Australia, but their number is legion and the breed mongrel.

The native dog, the enemy of the Squatter, inhabits the bush in great numbers, and his sheep-worrying propensities are such that a large price is put on his head.

A policeman that I had under my care for a hydrated tumour of the liver informed me that in the City of Sydney, he had over 300 stray
dogs to destroy, which had been collected in a few days.

In 1882 in Sydney 1300 stray dogs were destroyed. (Hydatid disease). In Victoria over 1700 are killed annually, and yet they swarm in all directions.

There are certain districts in each of the Australian colonies that enjoy the unenviable reputation of being Hydatid districts! These are mainly pastoral, where the droughts affect the people most, and where they have to depend on their supply of water from creeks and water-holes.

Men and dogs alike often imbibe from the same source; the dogs freely partake of raw sheep that are slaughtered for the family use, and thus have every chance of freely
developing the Taenia.

Macfellinary of Sandhurst, Bendigo Gold district, (Hydatid disease) directs attention to the prevalence of this affection on the Gold fields. Almost every Miner, especially in the Outlying Quellies, has a dog chained up by his hut, and which lives more or less on intimate terms with its master. They live largely from the offal of the butcher's shop, and from what they can steal.

The Official Statistics of deaths from this disease in Australia, seems to me to be far below what is really the Case.

It is a very striking fact that the nature and gravity of Hydatid disease is but slightly understood,
even among the inhabitants in the districts where it is common.
In all the cases that have come under my notice, the patients had no idea whatever of the nature of their Malady, on the contrary, I have occasionally ascertained from them that some of their neighbours had died from the effects of swellings which very much resembled their own.

The incomplete Death certificates that Medical men fill up, such as disease of the liver and the lungs. According to Baxter (Statistics for Victoria 1887) probably in some cases are really hydatid of these organs.

In the Victorian Year Book for 1886, (p. 336) the death rate given
from Hydatid disease per 10,000 living persons taking mean average from 4 years to 10.

Victoria 5.97; N. S. Wales 1.66
S. Australia 2.99; Queensland 1.61

But these figures I am certain are far short of the mark, a state of matters aided by the difficulty in many cases in diagnosing the disease and where a post mortem examination is not obtained.
Situations

There is hardly any organ in the body where the Schistosomes is not occasionally found, even in the shafts of bones it finds from time to time its unwelcome habitat.

Like other parasites it has its favourite seat, and its frequency in the liver is conspicuous as compared with other regions.

The Ova from the stomach may find their way into whatever part the blood stream may carry them.

Thus they are lodged in the liver, Respiratory Organs, peritoneum, Circulatory apparatus, Brain, and Spinal Cord, Spleen, Kidneys, and Supra renal capsules, in the substance of muscle, subcutaneous tissues, the cavities of bone
in the orbit and eye, frequently met with in the breast, utilla, serotum, and testes, ovary, and joints. The Cases hitherto described as occurring in the uterus might possibly have been the ordinary hydrated mole, but the possibility of this organ being attacked is just as equal as many of the others.

From Reissers statistics (Die Echinococcuskrankheit 1877) based on the records of nearly 1,000 cases, about one half are described as occurring in the liver.

Fromcn from his observations (2,655 cases) gives the proportion as high as 69 per cent (Bidrag til kunbek at om de i Island endemiske Echinococcer).

Its frequency in the lungs is very much less. 11.3 per cent given by Thomas (Hydatid of lung) based on the Stu-
Notices of 2000 Cases.

From my own observations based on nearly 100 Cases the liver was attacked in 68 per cent. Whereas the lung cases only amounted to 7 per cent. The peritoneum comes next in frequency, and the other organs in more or less varying proportions.
Rate of Growth

No natural limit has been traced to the life of the hydatid. It may grow to such an extent that it is alone arrested by the death of its host. They are found undergoing degenerations at every conceivable age. They may retain their vitality for many years, even when their growth apparently remains stationary.

Hilton Fyffe (Practice of Medicine - Hydatid Disease) quotes Repnald and Dr. Budd, the former of whom is said to have met with an instance in which a tumour of the neck, which had existed for 43 years, from the age of 17 to 60, when punctured gave issue to an immense quantity of hydatids, all apparently living;
and the latter met with the case of a lady, who died at the age of 73, who was believed to have had two hydatids since she was the age of 28 years. Another case is referred to of a very large size, the first trace of which had been observed 30 years before.

Ziemmeen, Vol III quotes a case of Vulpian, where six months after the first symptoms, an echinocecaus found in the axilla of a girl had only attained the size of a small nut.

Barnier (These de Paris, 1840) collected 24 cases with good data, to test their duration from the first symptoms; he found that they were less than two years in three cases, four years in eight cases, 24 years in four, eight years in five and 30 years in one.
Leuckart (loc. cit. p. 544) has conducted a series of experiments with the young pig, an animal readily infected with hydatid, and found four weeks after the feeding with ripe proglottides some small points resembling tubercle (1 mm in size) in various places under the serous covering of the liver. They had a thick homogenous transparent capsule, with coarse granular contents. The connective tissue cyst enclosing the young echinococcus was everywhere in direct continuity with the connective tissue of the liver, and probably originated from it.

In the second pig killed eight weeks later the liver was found studded with the echinococci, which were double the size of the
previous one. The Cyato were all thickly distributed under the serous covering of the liver, and upon both surfaces of the organ. The Cyato looked like small beads of water which expelled clear fluid and when pricked. The Lamellae in the walls were neither very distinct nor sharply defined, and the membrane sometime attained the thickness of 0.07m. Nineteen weeks after the feeding, he found in the liver of a pig between 30 and 40 bladders as large as nuts. There were no heads to be found anywhere, and the cyato were mainly situated under the serous lining of the organ, some pushing the covering before them in a lump so that only the lower half were imbedded.
in the substance of the liver.
Their average diameter was 10 to 12 mm. In shape they were uniformly round. There was an inner lining closely adjoining the cuticle ("Germinal membrane" Hurley) of a cellular structure. The cells were mostly pale and delicately outlined like drops, others were granular and of larger size, not unlike pus corpuscles. Neither Naumann (Entwicklung des Echinococcus) nor Leuckart have found the presence of a vascular system in the parasite. The cuticle possesses a considerable capacity of imbibition.

The Echinococcus attains its full development by the formation of the heads. Leuckart found them only
when the bladder was 15 to 20 mm diameter, and about 5 months old. In the case of a Cow (loc. cit. p. 611) he found a cyst 10 mm where the formations of heads had already begun, while in others the size of a hens egg there was no trace of them. In the "Echinococcus Multilocularis" he found heads and bladders less than one mm. Frequently however cysts are found to attain enormous dimensions without any trace of heads Asephalocysts.

The factor determining sterility is not known but it is probably in the nature of the parenchymal sheath. von Siebold (Kurdaehs physiologie book II p. 183) first discovered that the heads were enclosed in small capsules - brood capsules -
but stated also that others budded freely from the wall, in the form of little processes which were solid from the first. It was also maintained that the heads could wander from their original moorings, either by the bursting of the brood capsule, or by their detaching themselves from the parent cyst wall, and retaining their vitality roamed freely for a long time in the fluid of the cyst. According to Leuckart (loc. cit. p. 605) heads are alone developed in brood capsules, and that throughout life all the parts of the Echinococcus, including parent cyst, brood capsule and head, are in direct continuity with each other.
Isolated heads in the human echinococcus situated upon the parenchyma of the parent cyst, have been several times found by Klebs (Hand-book der pathol. met. bk II p. 586). Henckart explains Klebs' description of the genetic relation of the heads to the bladder, from the appearance that the former sometime presents when the wall of the brood capsule becomes macerated, as may happen when exposed to the influence of external agents.
Daughter Cysts

The brood capsules are Morphologically repetitions of the parent cysts, retaining their connection with it, and having as their share of work the formation of heads. The hydatid may grow to a considerable extent while the brood capsules and heads remain attached to the cyst wall. The growth in the hydatid seems to take place in the cuticle mainly, which retains all through its elastic feel. The connective tissue of the ectocyst increases with the general growth of the parasite, and is often from five to ten times as thick as the cuticle. It is usually very vascular, and its
vessels are sometime varicose, and tortuous, so that in a mere exploratory puncture they may constitute a serious danger.

I have noticed on several occasions the entire absence of a parent cyst wall, and instead a tough fibrous capsule corres-
ponding to the ectocyst. In these cases they were densely packed with daughter cysts. The pressure of the contents might easily have obliterated the cyst wall, as seemed to be the case in one specimen where the daughter cysts were nearly all healthy, but mingled with a quantity of amorphous granular débris. Helm records a series of cases where the parent cyst wall had either disappeared
or where the remains of it were seen here and there pulpy and degenerated (Über die produktive Sterilität der Schizontococcus-Plasen). Leuckart states (loc. cit. p. 614) that in many cases daughter cysts may arise etiogenously, which may in turn develop beside the mother cyst or become aborted.

There is a case of this kind taken from the leg of a horse fully described by Virchow (Archiv f. pathol. Anat., Bd 29 p. 180) and Leuckart observed their growing from the deeper layers of the cuticle, and budding out like small hernia-like processes.

This form is common in domestic animals, especially the pig. Küchenmeister quotes two cases occurring in the human subject.
(parasiten first edition) and Sommerbrodt (Archiv. f. pathol. Anat. 1836, p. 272) records 17 cases, and Böcker Heisser and Helm over 60.

Kuchenmeister maintained it to be the representative of a distinct species and gave it the name of "Schinococcus Solediparum", but as other forms produce Scolecis, Kuhn's designation of "Endogenous Schinococcus" is much more preferable. Reckart found that the daughter cysts produced brood capsules much sooner than their parents.

Daughter cysts are usually found in the interior of the parent cyst, and often in very large numbers. They may
number several thousand and are usually found of all sizes. In the case of a young woman aged 18, where symptoms of faecal vomiting necessitated the opening of the abdominal cavity, the cysts must have numbered several thousand. In one case of the hydatid of the smaller omentum, where the patient died from intestinal haemorrhage, I counted 800 daughter cysts. (Plate VII.)

I have often found the daughter cysts beset with brood capsules and heads of the most perfect type, but they are often sterile. (Neuckart 'loc. cit. p. 617). Herbert and Helm had to examine many specimens before they found them.
Daughter bladders are found in cysts of all sizes. There is no authentic case where a hydatid smaller than a walnut contained daughter cysts. Plate XVI shows two hydatids in the lung not larger than a wal-nut quite full of daughter cysts undergoing degeneration.

Parent cysts may be packed quite full with daughter bladders growing so rapidly that many may die from the pressure in the struggle for existence. On the other hand the number may be few. Davaine (Traité des Ontozoaires, p. 456) records a case of hydatid of the liver, weighing from 8 to 10 pounds, where there were hundreds of
daughter bladders that varied from the size of a pea to that of an egg; while one weighing 15 pounds contained only 25; and another 12 pounds in the pouch of Douglas contained 10 about the size of nuts. In other cases which occupied the whole of the lower lobe of the left lung, he found two and three respectively.

The daughter bladders sometimes attain a large size. I have noticed them frequently as large as an orange, but they are sometimes found to be much larger, even to the size of a Child's head, and all sizes downwards to a pin's point. They are usually spherical, but the continual pressure of each may
give them a slightly flattened appearance. Some may be furnished with facets, where several cysts have become adherent. The daughter cysts in the endogenous form develop mainly from the brood capsules and the heads.

Bremner, Siebold, Wapener, Schrödt, Neumann, Rasmussen, and Leuckart have described the transformation.

The change in the heads may be completed into the cyst form after it has burst through the wall of the brood capsule. The daughter bladders may also develop apart from either brood capsules or heads, from the pacculation of the parent
cyst wall. The process bears the strongest resemblance to the etogenous form of development only the cyst keeps within the parent cavity. Eschricht (Flockhart loc. cit. p. 623) has observed that the process is sometimes incomplete, so that the cyst wall presents the appearance of cauliflower-like espacesences, which always enclose hollow spaces.

The Schinococcus is found dead at all stages of its development. The cause may be found sometime in the condition of the organ in which it is situated, as the result of some inflammatory trouble it may become degenerated into an ordinary abscess.
Some cysts filled with daughter bladders, may be found presenting an appearance similar to dried figs packed in a box; they are usually not very large when found in this condition. The cysts on the other hand, may be one solid cheesy mass, and the microscope shows only amorphous debris and hooklets. It may be found as a solid calcareous mass replacing the parent cyst wall, there is sometime noticed an almost complete layer of lime salts, even where the daughter cysts are apparently healthy.

Heuckart has noticed in the livers of cattle, the cellular tissue immediately underlying the bladder wall becoming cloudy, and
degenerated, and the cyst wall undergoing caseoous degeneration at the same time.

The contents sometimes form a thick mass of a gummy and honey-like character, which is so tenacious that it generally refuses to flow through a large sized tube.

Core has prepared a set of specimens of hydatid for the Norfolk and Norwich Hospital illustrating the process of natural cure by calcareous degeneration (Cothold parasites). Berthold (Göttingische gelehrte angezeigen p. 1978) found in a hydatid of the lung of a domesticated a calcareous shell with two distinct layers, the outer composed of phosphate, the inner
of Carbonate of Lime.

Thomas (Hydatid disease) has described a case of epithelioma, arising in the cyst wall of a liver hydatid. Simple hooklets or cromes of hooklets, or whole Scolices, and crystals of Cholesterol, are often found in large quantities among the contents of the cyst, which have undergone calcareous degeneration.
Multiple Hydatids

In most cases of multiple hydatids one of the cysts is generally to be found in the liver. I have elsewhere made mention of case that came under my notice, of multiple hydatids in the peritoneum, where the one in the liver was only about the size of a walnut, and quite degenerated, while all the others to the number of over twenty were actively growing, and some of them of large size.

It is difficult to explain whether the multiple cysts are the result of numerous infection of ova, or of a single infection, or resulting from an ovum which in its turn has given rise to numerous progeny.
The mode of **auto-**
multiplication of cysts is fully established
by Leuckart and Küchenmeister
and other authorities. In account
for multiple hydatids by this
process one would expect to find
them lying close to each other,
which is far from being the case;
on the contrary they are often
wide apart, and present differences
in size and appearance from each
other.

Naumyn and Rasmussen's theory,
that they arise from the heads and
brood capsules of the parent's cysts,
involved the difficulty of supposing
that the primary echinococcus has
opened into a blood vessel, and
allowed its brood capsules to
travel all over the body.
Leechkeart (loc. cit.) regards it as most probable that multiple Schinoccoci resulted in most cases from a single infection and one which furnished not a single but many embryos. He found the same diverse differences developed from the same feeding as is nearly always found in cases where there are multiple cysts, so that in cases of Schinoccoci, it may be that many may have originated from an infection of numerous embryos.

He cites the case of the Boenurus, which is most commonly found solitary but is not always so from the first, and from analogy it appears not improbable that there may be numerous or e
introduced at the same time, and as the developmental result does not necessarily depend upon any given number, but on the sum total of different vital circumstances, one might proceed to develop to a large size, while all the others remain sterile.

There is no direct evidence hitherto published that the food capsules or heads liberated from the parent cyst may develop into multiple schizococci at some distant part where they find a lodgment. (Plates XIX) It is from a specimen taken from a patient who died from exhaustion following a suppurating hydatid of the liver.
A cyst growing from the undersurface of the right globe had been operated on three months previously by free incision and its edges stitched to the abdominal wall. At the post mortem examination I found the large omentum simply studded with minute tubercle-like specks of a white pearly appearance; some were the size of a pea, and a few the size of a horse-bean.

There was a similar condition on the upper surface of the spleen, on the kidney and mesentery. The most wonderful condition however was in the peritoneum where it is reflected to form the pouch of Douglas and the utero-vesical pouch. It had a rough papillomatous
like feel. There were hundreds of small cysts on the serous surface of the bladder on both aspects of the uterus and in the anterior and posterior pouches.

The great mass of these elevations were just the size of tube side grains, but a few were the size of a pea. A section taken from the omentum and from the peritoneum in Douglas's pouch gave the characteristic appearance under the microscope of young hydatids. They showed the lamination of the cuticle and the young actively growing connective tissue cells of the ecto cyst. In some hooklets were found. From the difficulty in cutting a section of the true cyst wall, most
of them appeared under the microscope, as if the cyst wall was
wanting, but in others it appeared shrivelled up with the hooklets em-
bedded in its substance.

There is no doubt that they were secondary cysts some of which
at least had developed from the head of a parent hydatid, and
that in all probability they escaped into the abdominal cavity
at the time when the patient was operated on. If this be so, as I
feel certain that it is really the case then an additional element
of danger is added to those usually attendant on the treatment by
aspiration. It is probable that such a mode of development may
account for some cases of multiple
Hydatids of the abdomen.
The frequency of their seat in the omentum and in the most dependent part, as for example the recto-vesical pouch is a point in favour of this view. This of course necessitates the presumption that the fluid has been permitted to leave the parent cyst in some way. I have cited a case of a lad aged 20 who came under my notice two years ago with hydatid of the liver. An exploratory needle was passed into the tumour several times and only a few drops of hydatid fluid and a shred of membrane obtained. No operation was done as his symptoms beyond the swelling were almost nil. When he presented
himself 2 years afterwards, there was a distinct mass of small cystic tumours felt in the omentum.

General Symptoms

In itself it is a painless affection, and may develop to a considerable size before the patient's attention is drawn to it. (Plate XIX) is a diagram of a patient who had never sought relief till it had assumed enormous proportions. It is surprising how large they may grow without producing any appreciable disturbance in the condition of the host. In the abdomen, for example the
Cyst may extend from liver to pubis without any pressure symptoms arising. In fact the hydatid cyst of the abdominal cavity is noticed so often to avoid pressing the large vessels that I look upon the presence of dilated veins in the abdominal wall as weakening rather than strengthening the diagnosis of hydatids. The symptoms indicating their presence must be naturally very manifold, and their symptoms and prognosis must depend entirely on the organ and seat of their growth. The larger they grow the greater the risk to the surrounding tissue of the organ in which they are imbedded, so that
the symptoms arising from the pressure effects may be the first indication of the presence of the parasite. Thus pressure on the bile ducts, and the icteric symptoms resulting, is not uncommonly the first sign that tracks their presence in the liver, and a short hacking cough and an attack of haemoptysis, may first lead to their discovery in the lung. In the eye they are early detected from the loss of sight they cause.

They are free from pain in themselves unless they involve by their presence some branch of nerve; pain however may be the only symptom in some cases that leads to the discovery of
their existence. A young woman came under my care for a persistent pain under the free margin of the ribs on the left side. It was extremely tender to the touch and the condition had been more or less constant for over a year; there was nothing to be seen or felt, but on putting my hand under the ribs and making her take a deep inspiration, I felt a cystic tumour descend; on inserting the aspirating needle I drew off one pint of clear fluid containing scolices and wood capsules; her former pain quite disappeared. In another case, a man aged 35, sought relief for severe intestinal haemorrhage: he succumbed to the exhaustion.
which followed. The post-mortem examination showed it to be due to the results of constant pressure on the portal vein.

Patients as a rule are quite ignorant of the nature of the swelling from which they suffer, and being free from any degree of pain and their general health often not in the slightest affected, they are content to leave the swelling alone until some complication arises. Recently a patient informed me that for several months past he had noticed a swelling over the region of the right kidney appear and disappear, followed each time by copious micturition of a brownish color, with long shreds of
strings of white material. On
examination I could detect no
increased dulness over the region,
and the patient disappeared
before I could establish a true
diagnosis.

Occasionally there is
developed a condition of cachexia,
even when the cysts are
found quite healthy at the opera-
tion. The patient loses flesh and
strength, has some pyrexia and loss
of appetite, and a moist clammy
skin. The condition is specially
noticeable in cases where the
abdominal cavity is crowded
with daughter cysts. Where sup-
puration has followed some
inflammatory action, there may
be rigors, fever, and great exhaustion.
The hydatid may even practically destroy a whole organ in those cases where its function can be relegated to another as, for example, the kidney and the lung, without the patient being aware of anything unusual. Plate (IV) shows a case where the whole of the right lobe of the liver was replaced by a single cirrat, and the left lobe hypertrophied to twice its normal size. When situated in a vital organ as the heart or brain, the patient may die suddenly without any previous symptoms. A dull heavy feeling is sometimes experienced by patients in whom a hydatid of the liver is not distinguishable by its size. In the case of a patient...
aged 30, a policeman, who came under treatment for Haemorrhoids, he complained of a feeling of fullness, with pain in his right shoulder, and a dull aching over the liver. A small aspirating exploratory needle drew off several ounces of hydrated fluid.

This patient, a year before, included among his official duties the feeding of a large number of stray dogs collected from time to time to be destroyed, and thus was quite in the way of becoming tenanted by this form of unwelcome guest!
Diagnosis

The diagnosis is only positively established by an exploratory puncture.

The presence of a tumor with a globular and cystic feel, slowly growing without general constitutional disturbance, and an absence of pain, would point to the probable existence of hydatid, but they so often do not exhibit even these symptoms that one must be careful in committing himself without some actual proof.

A patient aged 28 complained of a swelling in Scapie's triangle of the right leg. On the feel it was hard but slightly movable and about the size of a goose's egg. No result was got from several exploratory
punctures, and prepared to meet with a sarcoma, an incision was made down to it, but a prick from the knife caused the tumour to collapse and to reveal its real nature, which was a solitary hydatid with a very tough "cetu-cyst," growing from the deep fascia of the thigh.

Latterly I had under observation two female patients, each of whom had a swelling in the abdominal wall, a little below the umbilicus. The smaller of the two was the size of a hen egg, and the other twice that size. They both felt equally hard and neither the history nor exploratory needle aided the diagnosis.

On cutting down the smaller of the two was found to be a hydatid...
cyst, and the larger a paravertebral mass. They were both growing from the sheath of the rectus muscle.

A male patient aged 50 had a swelling between the posterior border of the right scapula, and spinous process of the vertebrae, measuring from above downwards 5 in. and transversely 3 in. It was soft with a distinct lobulated feel. There were no results obtained from the exploratory needle. The superficial muscle could be traced over it. An exploratory incision showed it to be a hydatid packet full of collapsed and dried daughter cysts. The cyst itself took origin from the deep portion of the Spinalis Dorsi. The bursa cyst was thick and tough, and
there was an entire absence of
parent cyst wall, as if it had become
absorbed by the presence of its progeny.

When it is obstructed in its develop-
ment at one point, it may grow in a
direction where resistance is removed
by means of a diverticulum, like a
ram's horn and filled with daughter
cysts of various sizes and in direct
continuity with the parent cyst. Plate
C

The hydatid tremor, or thrill, or
purring first described by Brünnov
(Zeit. med. Woch. Vol III) is an aid of some
value in the diagnosis of hydatid.
It is however very inconstant, but is
most distinct in those cases where
daughter cysts are present. The
cysts when made to strike against
each other, produce a tremor similar to that noticed when shaking a mass of calf's foot jelly.

One however, fails to get it, especially when the parent cyst is tightly packed. A similar sensation is often produced in large single cysts, and is then indistinguishable from an ordinary ascitic wave, or from the feeling produced in percutting a cyst of the broad ligament.

The age of the patient cannot be relied on, as a point in the diagnosis.

No age seems to be exempt.

They are most frequently observed between 20 and 30 years, according to Leuckart, and between 20 and 40.
according to Thomas (hydatid disease)
from the slow growth of
the parasite and from the greater
risks of infection that are encountered
in the pursuits of adult life this is
just what one would naturally expect.
Neisser and Ruben (Leuckart
loc. cit. p. 641) drew attention to the
preponderance of females subjects
affected with the parasite. The
former gives his proportion as 210:
148 and the latter as 253:181.
The reason ascribed is the affect-
ianate intimacy that is often noticed
to exist between them and dogs.
This condition may be true as
applied to Germany and Iceland,
but in Australia where the habits
and occupation are different, the
males are most likely to be infected.
Keuckart states that it is rare for the echinococcus to occur in early childhood (loc. cit. p. 642) for the reason of its slow growth, and cites the cases of Finser and Thorstensen who operated on a child of 6 and 14 years respectively, as the youngest cases on record.

Dr. Larrant, of Sydney, operates on a young child, at the breast, for hydatid in the left aurillary region, containing daughter and grand-daughter cysts. (Australian Medical Gazette for 1889?)

If children are in the way of becoming infected their age is certainly no immunity. Within the last 12 months I have observed hydatids in at least 12 children their age varying from 5 to 8 years.
They usually make a good recovery. The organs in which the cysts are situated, are less likely to be so completely affected as in the case in the adult subject, where the pressure changes are more permanent.

The Hydatid Fluid

When healthy it is limpid and transparent with a faintly sweet pleasant odor and saltish taste.

It is neutral or alkaline in its reaction with a specific gravity ranging from 1004 to 1005. It contains an excess of chlorides in the form of chloride of sodium, 6 parts per thousand and over, and it is free from albumen. If the fluid is placed in
a transparent glass vessel, small whitish specks are frequently seen floating in it; these are Scolices or brood capsules containing several of them and shreds of cyst wall.

It readily undergoes decomposition, emitting an offensive odour, and these Scolices or brood capsules examined microscopically several hours after the fluid has been withdrawn from the cyst are seen to be broken up, and their constituent portions to have parted from each other.

A single exploratory puncture may alter the whole character of the remaining fluid, by its becoming co-mingled with transudes serum, and thus contain albumen; in which case the microscope alone can make the diagnosis clear.
Hydatid fluid thus mixed with serum speedily suppurates, but as a rule it remains of a thin liquid character a fact of some importance in considering the treatment of this affection.

It contains abundance of leucin and lysinin.

Heintz showed that it contained succinic acid and Naumann confirmed his discovery and also found the presence of Inosit, (Müller Archiv. f. Anat. u. Physiol. p. 921 1862).

Minute quantities of grape sugar may also be found in Asets, in and around the livers, and abundance of Cholesterol crystals, and Crystals of kematoioidin which are a constant factor in the Multilocular echinococci.

The fact that Barker (optie eno-
you in the human kidney. I found in a case of hydatids of the kidney seric acid, otalic acid, triple phosphate, and other solid constituents of the urine, points to the presence of these contents as a means of diagnosing the organ from which they grow, as physical signs alone do not always lead up to an absolute diagnosis.

Ascitic fluid in persons who are hydraemic as the result of amplyid degeneration, is said occasionally to present some of the chief characters of hydatids fluid, especially its clear character, and absence from albumen. (Ziemssen Vol. 17) So also is the fluid of these rare cysts in the broad ligament, but the microscope and the presence of grape sugar, or succinic acid, should render the
diagnosis unequivocal. In one case the fluid of a large parovarian cyst removed from a young woman, which I carefully examined, was undistinguishable in its physical characters from hydatid fluid.

It was perfectly transparent, alkaline in reaction, specific gravity 1007, no albumen and excess of chloride. The microscope gave negative results.

In cysts which are undergoing a process of decay, the contained fluid may sometimes present different colours without seemingly having gone on to suppuration to any extent. In a large cyst situated on the under and posterior part of the liver in a male patient aged 40, the exploratory
Needle drew off dark green fluid which in the mass looked like water from a dirty coal bucket.

It was only after a long microscopic search that I found the presence of hooklets. On opening into it, 3 pints of this fluid were removed, and the cyst wall proper was quite separated from its capsule, and broken up into pieces which looked and felt like steeped leathers. The peculiar colour was doubtless due to the presence of bile, which when it finds its way into the cyst, is according to Virchow (Diseases of liver) inimicable to the life of the parasite. In the same way blood-stained fluid may be obtained, its colour depending on the age of
Extravasation. There are many sources of hemorrhage into the cyst cavity, either from the vascular condition of the cyst cyst or from some vessel of importance which may become involved in the growth and pressure of the tumour. The fluid may be replaced by gas, pus, or a thick, yellow, colloid matter, or simple caseous debris, or a deposit of pure lime salts, but these are referred to under degeneration.

**Hydatid Rash**

The urticaria-like eruption which sometimes follows the tapping of hydatid cysts, more especially those situated in the abdominal
cavity, is spoken of as the Hydatid Rash.

It is only noticed in a small proportion of cases, by those who have had the opportunity of treating this disease to any extent.

It usually makes its appearance shortly after the puncture and lasts from 2 to 3 days. It is said sometime to appear prior to and independent of any operative interference. Dr Verco mentions a case (Australian Medical Gazette, 1892) where the rash appeared before the patient was operated upon; it attended an attack of giddiness and vomiting which developed suddenly. Its appearance cannot always be explained by a diathetic
tendency as enquiry has frequently failed to establish its appearance before the patient was punctured. Plate (XX) shows the rash on a patient the day after an exploratory puncture was made. It covered the abdomen, the chest and arms; was intensely itchy, and there accompanied it an aggravated condition of Cutis Anserina. It persisted for 2 days, she had never seen nor experienced anything of the kind before, although her tumour had been growing for at least 5 years. It accompanied a high temperature, and a considerable amount of abdominal pain. These conditions generally accompanied it. Dr. Macgillivray, Sandhurst, Victoria (Hydatid Disease) relates
that, in one of his cases which ruptured into the abdominal cavity, intense urticaria followed which lasted for 3 days. In the Lancet of January 18th 1889, a case is recorded where the patient nearly succumbed from the affects of a simple puncture of a cyst in the liver, and where the rash was most profuse on the abdomen and legs and extensor surface of arms, but not appearing on the chest and face. Vidal (Annales de Dermatologie et de Syphiligraphie) mentions that he has twice seen it follow capillary puncture of liver hydatid and lasting on each occasion for 48 hours. Dr. Thoma Adelaide also records a case where a fatal issue nearly followed the
Tapping of a hydatid of the spleen, and where the rash was distributed only on the face, neck, and arms. (Hydatid Disease)

The rash may appear in the typical form of urticaria or it may present itself as a diffuse erythema. In one case that I had occasion to tap six times for a hydatid of the liver, which kept persistently filling and refilling, the diffuse redness on the face and chest was quite noticeable, but unattended with any itchy condition. In a case of Dr. Morrison's, Melbourne, (Australian Medical Journal 1883) the urticaria was accompanied with marked injection of the capillaries which persisted long after the wheals
had disappeared.

It has been attempted to explain the occasional existence of this cutaneous appearance, on grounds other than reflex, and an explanation has been sought for in the nature of the hydatid fluid itself.

Professor Roy of Cambridge in the Lancet of Jan. 15th 1897, gives the results of some experiments with hydatid fluid, carried out with a view of ascertaining the nature of the cause of the alarming phenomena which from time to time, are observed to follow the sudden passage of this fluid into the blood stream, and the abdominal cavity.

The mischief is C.C. of Hydatid...
fluid into the jugular vein of a Guinea pig, which gave an increased frequency to the respiration, and caused the hearts beat to become irregular; an additional quantity of 6 c.c. brought about no further noticeable result. He next opened the peritoneal cavity of 2 more Guinea pigs, and injected 6 c.c., but during the time they were watched the results were negative. He took a large dog (a cross from a collie) and fastened a canula to the vein and carotid which was connected with a kymograph. While the blood pressure was marked at 160 mm. of mercury, the pulse 68, and the respiration 24. Twelve c.c. of fluid was slowly injected into the vein. Five minutes after the
Blood pressure was estimated at 135 mm. Mercury, the pulse 70, and the respiration 37. Twenty minutes later, 14 cc. were injected into the jugular vein, with no further marked change.

Twenty minutes afterwards 20 cc. caused the blood pressure to sink gradually, the first five minutes from 137 mm. to 63, the pulse to 83, and the respiration to 19. As the animal seemed dying, a small dose of atropine was injected into the vein. When the blood pressure rose to 125 mm. at which point it remained, notwithstanding that a further quantity of 40 cc. were injected at intervals of five minutes during the period of rise. The pulse rose to 72, and the respiration to 28.

He summarized his experiments thus:
In Hydatid fluid there is a substance which has a powerful effect on both the heart and the respiratory mechanism. From the two first doses little effect was produced, but a larger dose resulted in a slowing of the heart from 70 to 30 per minute which was very striking. The acceleration of respiration by the first dose, and its great slowing of a further dose, of 20 c.c. is also very remarkable. The great fall in the blood pressure after the third dose shows that the fluid from Hydatid cyst contains some substance which can effect the blood pressure in the systemic arteries to a very serious extent. He also pointed out that the marked change which affects
the heart beat, the respiration and blood pressure after the injection of Atropine, seemed to point to its practical importance in such cases, as well as to its great interest.

Professor Roy's experiments are of course too limited to lead one to conclude definitely that the fluid contains some specific principal capable of affecting the cardiac and respiratory mechanisms through the nervous system, and my own observations, as far as they have gone, have afforded me no further conclusive proof.

I took a male beagle dog weighing 12½ lbs. and noted the normal pulse, respiration, and condition of his pupils. Hypodermically
I i e f f e t e r 2 5 m. of freshly drawn hydatic fluid about which there was no doubt as to its exact nature. For the first 15 minutes beyond a slight increase in the pulse and respiration which I attribute to the shock or pain from the puncture, there was no other noticeable feature developed. At the second 15 minutes 25 m. more were injected into the tissue of the abdominal wall, with no further result. The third and fourth 15 minutes after, similar doses gave negative results. I then doubled the dose for the next two quarters of an hour, and then lastly injected 100 m. which the animal took very kindly, and exhibited no symptom of distress.
whatever. Three days after when a fresh hydatid cyst in a boy, of 9 years, came under my notice, I opened the peritoneal cavity of the same dog and injected 2 draehms. The wound was stitched up with fine cat-gut and covered with a coating of collodion, and the dog recovered without a noticeable symptom. He was killed three weeks after and no trace was found in his abdominal cavity of peritonitis, and the areas which marked the seat of the hypodermic injection were distinguished by a little inflammatory thickening. I again opened the peritoneal cavity of a male Scotch Terrier weighing 12¼ pounds, and injected 2 drams of freshly drawn hydatid fluid and
the animal during its recovery never seemed any the worse.

It is difficult to explain the appearance of the rash from the specific nature of the fluid itself, and more especially, as such eruption are observed so often to arise where no such cause is possible. Dr. MacCall Anderson records a case (Disease of the Skin) where Urticaria appeared on a patient every time a uterine sound was introduced, and in another case where the mere mention of Nettle rash would cause it to appear.

An Urticaria-like rash is occasionally noticed to follow the simple act of tapping, in cases of pleurisy, with effusion.

Alarming symptoms however have been frequently observed to follow,
when there was reason to believe that the fluid had gained entrance into the blood stream.

There is Bryant's fatal case (Clinical Society Transactions Vol. xi) where he found that inside the hydatid capsule, the trochar had transfixed a large vein, and where he attributes the fatal issue to the fact that on the withdrawal of the instrument, hydatid fluid had escaped into the Portal vein.

In the cancer iomy 15th 1887, there is a case mentioned where the patient a few minutes after being tapped for a cyst in the liver was seized with faintness, dyspnoea and vomiting, the extremities became cold, the radial pulse almost imperceptible and the heart sounds almost inaudible.

Thomas (hydatid disease) had a
case where a few minutes after tapping a cyst of the spleen, the face became dusky, hands and feet cold, the radial pulse imperceptible, and the respiration laboured and hurried.

Dr. Humphrey, Addenbrooke Hospital, the lancet for 1887 records his opinion of cases that have come under his observation that hydatid fluid may enter a wounded vein at the time of puncture or escape into the peritoneal cavity and be absorbed as indicated by the rapidity of onset and urgency of symptoms. Hilton Haynes hypothesis (loc. cit. vol. ii) is that after the withdrawal of the trochar, hydatid fluid may be sucked into the portal vein, and
act as a direct and fatal poison. The veins on the surface of the body cyst are occasionally observed to be dilated and varicose so that there is ample opportunity for them to be pierced by the passage of a trochar and thus make an entrance for the hydatid fluid.

Six months ago I witnessed the case of a strong, powerfully built man aged 28 who was found lying in a public park apparently dead. He was seen to sit down quietly on the grass on a summer’s afternoon 40 or 50 yards from where I was standing. When I examined him he was livid, flaccid and cold; the radial pulse was imperceptible, his breathing was faint
and irregular, for a few minutes before he died. The post mortem showed that there were 2 hydatid cysts on the undersurface of the liver. The smaller one was filled with gelatinous debris and undergoing a process of resolution, the other about the size of a foetal head was filled with dark fluid blood, and attached to the portal vein at its sinus where and into which it had ruptured. There was nothing worthy of note about the other organs. The lung showed some hyperstatic congestion, and the right side of the heart was firmly contracted. A careful examination failed to discover any other cause to which death
could be attributed. It is surmise that after the patient had lit his pipe, he stretched himself full length and rolled from back to front, the strain during which causing the curious accident that brought about his death.

The cases where a fatal issue has resulted from a simple puncture have nearly always been confined to the abdominal cavity, unless in those cases of pulmonary hydatids where the obvious cause of death was the flooding which followed the ruptured cysts.

Dr. Martineau, however, August 1875, had a patient who, after being punctured with a
five trochar for a cyst in the liver, became sick and faint and died. In Bartholomew's Hospital Reports Vol 16 there is the record of a case where the patient died suddenly after the trochar had penetrated the small cyst in the right lobe of the liver.

In the absence of any direct proof that hydatid fluid is in itself a poison, the majority of the fatal cases may be attributed to shock. In the International Encyclopaedia of Surgery (p. 361) the symptoms which followed in a case of exploratory puncture of the liver seemed almost identical with those attributed to the absorption of hydatid fluid, and Dr. Thomas has
suggest that the symptoms might be explained by a sudden inhibitory influence on the heart, exerted in a reflex manner through the sympathetic supplying the liver or spleen as the case may be.

Hydatids in the Liver

It is this organ that the parasite most frequently attacks owing to the ease with which the Ova can reach it through the Portal Stream. A single cyst is the most common form that is met with, although the presence of 2 or 3 and more rarely a greater number in the same organ is by no means rare.
In the livers of animals who readily harbor the Echinococcus, as for example the pig, Cysts will be found penetrating the whole organ to the number of hundreds. In the case of multiple hydatids, one will generally be found in the liver while the other organs especially the peritoneum, omentum, spleen and kidney in number several dozen.

I have observed in one case of multiple hydatids that while there were several large Cysts in the omentum, mesentery, coecum, spleen, and kidney, all actively growing, the one in the liver was only the size of a shilling piece, and undergoing caseous degeneration.
Wunderlich (Archiv f. Physiol. Heilk. p. 283) mentions a case where the cyst in the liver was the size of a child's head. While in the spleen, omentum, behind the cecum and Douglas' pouch, there were 12 other cysts varying from the size of a pea apple to that of a fist, while under the mesenteric coat of the small intestine there were about 50, varying from the size of a poppy seed to that of a bean.

In one case where the patient died from the effects of a large suppurating hydatid of the liver, I found numerous cysts in the peritoneum, varying from the size of a bean to that of a pin's point (Plates x. xi. xiv.)
In the experimental cases of leucostoma he found the echinococci in the livers of the pig, lying beneath the serous covering, and in some cases they had grown mostly out of the organ involving but little of the liver tissue.

In man they may be found of considerable size without affecting to any extent the substance of the liver (Plate 7).

They seem to take their growth very commonly from the upper or under surface judging from the larger size they sometimes attain to without hollowing out the substance of the liver.
They may completely eradicate the whole of one lobe, while the other correspondingly hypertrophies (Plate VI). In post-mortem examinations I have found them not larger than a walnut embedded in the very centre of the liver's substance (Plate VI). In one case mentioned in Ziemsen Vol III a hydatid was found free in the abdominal cavity, lying alongside the liver, and had probably escaped from it.

The parts adjacent to the cysts show the usual atrophic changes in the cell elements due to pressure.

The various organs may
be considerably displaced according to the size and growth of the tumour: lungs, heart, and abdominal viscera. In one case of a large hydatid growing from the liver the great mass of the intestines was pushed towards the left side so closely as to lead to intestinal obstruction. They may reach below the umbilicus sometimes without producing any marked bulging or deformity; on the other hand when growing from the upper surface of the liver they may produce marked deformity by bulging out the ribs.

The area of the liver dulness may not be increased to any
tent, and yet a cystic bulging of 3 or 4 pints capacity, is occasionally met with. It has usually a tense elastic feel and the tension of it may be so great that a slight amount of external violence may occasion its rupture.

Cobbold (loc. cit. p. 137) mentions a case where a lad aged 14 yrs received a slight blow from a playmate where death speedily followed. The Post Mortem showed that a solitary hydatid had been ruptured.

Hydatids are not usually found developing in cavities lined with mucous membrane although such a condition is not unknown.
Thus, Zimmern Vol III refers to cases where echinococcus vesicles have been found in the gall bladder without any trace of a liver echinococcus having been discharged into it. By the same authoring a case has been referred to where a cyst actually developed into the interior of the vermiform appendix.

They may develop to an enormous size without producing jaundice or ascites, but in some cases of small cyst the jaundice may be very distressing.

A favorable mode of termination is where the contents pass into the intestine, along the common bile duct. Whole cysts may thus be voided per anum.
as in the case recorded by Davaine (Leuckart loc. cit. p. 649) where it was supposed that the woman was actually laying eggs; they have been known to pass intact with a diameter of 2 in.

In Graimann Vol. 18 there is a case from Nothlings clinic where in the course of several years a tumour appeared repeatedly and disappeared again in a short time with severe pain. During the last attack Jaundice arose and Cyst were evacuated from the bowels and about 4 oz. actually counted.

A Cyst growing from the upper surface of the liver may be found sometime to bulge up as high as the second rib and
in such a case the diagnosis between the condition and intra-thoracic affection is usually very difficult. Frenich and Bastels state (Ziemsen Vol IX) that in schizophrenia the line of dulness at the back descends as it approaches the spine, but this does not hold good in many cases.

Treatment

The treatment of hydatid in other regions comes within the scope of the general principles of Surgery. When within reach, the walls of the parent cyst should be dissected out. In the larger moveable
Tumours of the omentum and mesentery sometimes met with, they should be first treated with the introduction of long hare tip pins, before they are aspirated, as on account of their mobility they readily collapse and fall away from the seat of puncture. Thus should they suppurate the consequences may be very serious.

In such cases independent cysts are generally present in large numbers, so that their complete eradication is an almost hopeless task.

The cysts in the recto-vesical pouch are best reached and drained from the rectum in the male and from the posterior fornix in the female. In the case
of hydatids of the abdomen in a young woman aged 18, which had obtained a great size and which was treated by abdominal section a counter-opening was made through the pouch of Douglas and excellent drainage obtained. This patient made a speedy and good recovery.

A hydatid of the kidney may evacuate its contents into the bladder through the ureter, or may attain a considerable size and fall to be treated as an abdominal hydatid.

It becomes an important question whether or not a hydatid should be operated on as soon as it is diagnosed. An operation at any time is not without its dangers.
and many Cysts do under go complete degenerative change which result in a perfect cure as far as the patient is concerned.

From my own experience I have only found the Cysts of a small pipe undergo caseous forms of degeneration, which usually goes on to complete calcification. I have also noticed suppurating hydatids of the liver in 2 Cases where the patients died from other causes, and where the presence of them in this condition did not seem to affect their health to any appreciable extent.

If the patient could be kept under observation for some length of time and the appearance of the Cysts regularly
and carefully noticed, there
one would be justified in taking
a passive course as long as it
showed no tendency to increase,
and greater no-marked disturbance.
To wait till threatening symptoms
do appear is to increase the risk
to the patient as the changes in
the tissues around may become
so serious as to terminate the
patient's life even after the cyst
has been completely and succes-
fully removed.

The expectant treatment
which has been recommended in
some cases can be followed only
where the cyst have become
ruptured, either from the death of
the parasite, or from some accident
cause, and where the contents are able to find an exit either by some natural channel, or by some mode of apertures that the growth of it may have made for itself. Such a course is however comparatively rare and even when it does exist it becomes a serious question sometime whether it should not be aided by some definite plan of operative treatment so as to avoid the dangers and distress that may accompany the condition. This applies especially to hydatids of the lung which may rupture into a bronchus and eventually become wholly expectorated. The hypnoca and cough often beside the fatal consequences that have followed from the blocking
of the lungcyst, by means of piece
of the Cyst wall, are ever before
one is trusting to this plan of
treatment. Although on the other
hand there are many cases
recorded where the patient has
expectorated the whole Cyst and
made a complete recovery. In
the case of a young woman who
died from exhaustion consequent
on a ruptured cysat of the lung,
I found at the Post Mortem a
large Cyst cavity in the right
lung about the size of a foetal
head where the Cyst wall had
been expectorated and the rest
of the Cyst lying quite free from
its attachment to the lung sub-
stance.

The case is different of
course in the epididymis of the abdominal organs, where the cyst contents find their way into the alimentary tract, and make their exit per anum or as in the case of some Schistosomes of the kidney, passed by the ureters into the bladder from thence to be voided by the urinary passages. Interference in such case has only had recourse to where pressure of the parent membrane or that of its offspring threatens to effect the function of the organs into which they have emptied themselves.

Practical treatment resolves itself into medicinal and
Surgical, and the former as far as experience goes play but a minor part while the latter include the ordinary methods of tapping either by the Trochar and Canula, with or without the aid of the Aspirator, Electrolysis and free drainage.

**Medicinal Treatment.**

In 1867 Dr. Hjaltelin brought under the notice of the profession the use of Kamala in Hydatid Disease, (Edinburgh Medical Journal Aug. 1867) from which he obtained some satisfactory results that he attributed to the influence of the drug.

Dr. Macgillivray published his experience of the drug in this
disease (Australian Med. Journal July 1872). In this case, the Kamala had no effect whatever, beyond producing intestinal irritation, to which action probably the drug owes its reputation as an Anthelmintic. Dr. Bird, Melbourne (hydatid of lung) believes that medicinal remedies have some avail, and he records some cases of the disappearance of the cyst under drachm doses of tri-
chloride of Kamala combined with potassium of potash. In his wide experience he has found benefit also from the employment of terpentine internally, which he ascribes to its Anthelmintic power and its ready diffusibility. Dr. Thomas (hydatid of lung) is of
opinion that beyond relieving intercurrent symptoms Medicine is of no avail and simple adds to the stress of the patient.

In some of Dr. Bird's cases, where he attributes a favourable result to Medical Measures, the Cyst had been tapped twice or thrice, and had refilled, so that even while they did disappear during the regimen of Tarpentine, or Kamaele, the cases were unreliable as a test, for the mere tapping itself is a remedy which frequently leads to complete recovery even when the Cyst is refilled, the nature of the fluid is altered and the vitality of the Parasite is affected so much so that the exploratory puncture may lead to its death.
Dr. Heekord (British Med. Journul 1868) observed a case of hydatid
in the left lobe of the liver in a
woman aged 22 yrs. Disappear in
5 weeks under the use of 77 grains
of Iodide of Potash daily.

Daraine thought that he had
obtained some good from the salts
of Mercury (Lièrmous Vol III).

I have employed Kamala
and Tarpentine in large doses,
without being able to record any
specific action in their favour in
this disease.

Surgical treatment

The liver, lungs, and abdominal
organs generally are the regions
which specially call for the aid
of the Surgeon in this disease, so that the general surgical treatment, will be best discussed, by taking these organs in the order in which they are most frequently affected.

Surgical treatment of

**Hydatid of the liver**

I am convinced that as soon as the exploratory needle shows that the fluid, whether clear or purulent, is capable of flowing easily through a fine trochar, then it should all be drawn off at once by means of an aspirator, graduated so as to moderate the strength of the flow.

There is not always a marker
localised bulging to afford without any difficulty the Operator a seat of Selection for his Trochar, and as the diversity of Cysts met with in the liver is very great, the exact area through which to pierce becomes a matter of practical importance. When they grow from the under or surface of the liver the direction of least resistance is usually downwards and forwards and they are as a rule easily reached, if they have attained any appreciable size; on the other hand when they grow from the upper surface, the Surgeon may be unable to reach them from the front, even when they have attained a large size.

I have made a post Mortem on the body of a young woman, who died...
from exhaustion; abdominal section had been performed, some weeks previous to relieve her of a hydatid which was growing from the left lobe of the liver, towards its anterior edge; the cyst wall was stitched to the abdominal parietes and the original cavity had shrunk to a mere sinus. There was considerable bulging of the thoracic wall and I felt a large fluctuating mass in the posteri or portion of the right lobe, pushing the lung before it to the level of the second rib.

I have seen a similar condition in the case of a young woman aged 19 yrs, who died from exhaustion that accompanied a large hydatid of the lung. A layer had been aspirated in the
left lobe of the liver, and at the
post-Mortem, a large cyst was
found in the right, at the posterior
portion, on the upper surface.

In the case of another patient
aged 20 yrs., who had all the
symptoms of Hydatid of the liver,
accompanied with Jaundice and
Hydrocele, I failed to get any trace
of fluid, by means of a large
aspirating trochar, which I did
pass from the front. On the other hand
the fluid was easily obtained
posteriorly, midway between the angle
of the Scapula, and the axillary line.
The patient died the day after from
exhaustion, and the cyst was ob-
erved to be growing in a manner
similar to those described above.

In some cases, where they grow
from the under surface of the liver in a slanting direction from below upwards before it reaches the fluid contents.

At a post mortem examination on a man who was found by the police in Articule Mortis, I noticed that there were two cysts, on the under surface of the liver, each about the size of a coconut nut; he had died from the sudden rupture of one of the cysts. It would have been difficult to have reached them by passing the instrument at right angles, to the surface of the body while with the guide of the Anterior edge of the liver; by passing the Trochar at an obtuse angle, the cysts were easily explored.
Hydatids in the liver may be so situated as to be quite beyond the reach of surgical interference especially so when they are situated in the left lobe at its posteriors and under surface.

In a patient, male 42 yrs., who died from the effects of pressure on the portal vein, I found an hydatid cyst 4 in. in diameter, involving but a small area of liver tissue, passing behind the stomach and pushing the gastro-hepatic omentum before it.

Such cases however but seldom call for the aid of the surgeon until they have attained such large dimensions as to render them more accessible for treatment.
When there is bulging present to any extent of the lower portion of the thoracic wall, the apex will invariably be found to be growing from the upper and posterior portion of the liver and pushing before it the diaphragm. This is especially the case on the right side owing to its close proximity to the pericardium.

The fluid will be most easily reached by inserting the trochar, midway between the arthral hine and the angle of the scapula, in the right intercostal space.

When the swelling takes a different direction as for example downwards into the general abdominal cavity, then
no object to be gained in puncturing at other than the most prominent point. It happens sometimes however that the flow of the fluid comes to an end before there has been withdrawn a quantity as would reasonably account for the apparent size of the parasite attacked, and that puncture at another point may bring about freely a further flow. This may be due to the cyst wall freed from its tension blocking the inner aperture of the cannula. I have noticed at the examination of a patient who died from general hydatid in the abdominal cavity, two large simple cysts in the substance of the liver where
their walls had approximated to each other so as to give the appearance of a large cyst, divided by a complete septum. Withdrawal of the fluid from one no way affects the size of the other.

It is more common to find only one cyst in the liver; attain to any considerable size.

Darwine has recorded a case (Mem. Soc. Biol p. 106 1857) where the liver contained two large cysts, one of which at least contained three pounds of fluid; while there was also a large number of small echinoceci which projected only slightly from the surface of the liver.

Dr Verco (Australeni Med. Journal)
1884) records an exceptional case where he found at the post-
mostem an enormous suppurating
hydratio of the upper and back-
part of the right lobe. Another
in the right lobe of a smaller
size—a third in the epigastric
region—a fourth holding up a
joint of fluid in the hypochondrium,
a fifth in the left lobe under the
diaphragm—and a sixth of a small
size in the substance of the liver.
They were all distinct from each
other and contained different
coloured fluids.

Should the contents of
the cyst refuse to flow through
the trachee, to an extent commen-
surate with the size of the tumour,
then we have to deal probably
with daughter Cystos, in which case more extensive operative measures must be resorted to.

The Cyst may be deep seated so that the Trochar and Cannula employed should be a long and fine one, as the fluid from a simple hydatid flows easily through such an instrument.

Some authorities do not favour the additional use of an Aspirator. Fitzgerald (Hydatids, Heath’s Dictionary of Surgery) speaks of it as involving the risk of exhausting the receiver to such an extent that the dilated vessels of the adrenalinia may be ruptured and a dangerous and even fatal haemorrhage may follow. Dr. Bird (Hydatids of the lung) has found
no special advantage to be derived from its use, and con-
demns it, in thoracic surgery generally.

Macquillany (hydatid disease) has found the simple trochar
safest and the most satisfactory. I have treated, and see
have treated, many cases of hydatid with the Aspirator, and with
the most satisfactory results, the operations being unattended
with dangerous symptoms beyond what could be fairly attributed
to other causes.

With a properly adjusted Aspirator the pressure can be
moderated to any degree and the contents of the sack more
completely and thoroughly evacuated.
Complete evacuation of the Cyst at an Operation affords a better chance of keeping its walls more closely approximated by means of appropriate pressure in the form of a thick pad and fixed by a broad bandage.

As a rule a hydatid if only partially erupted attains to its original size in a few days, by small fluid poured out from the vessels of the beta-cyst, which have been relieved of their pressure. Such fluid may become absorbed without re-secretion, or it may pass on to pus formation. Generally tapping even when it persists in refilling leads to a complete cure in the end.

I aspirated a hydatid of the liver in a patient, a man aged 26 yrs on the 23rd July 1886, and drew off
3 pints of fluid, bile-stained, containing slight albumen excess of chloride, Bokleto and Erythrit of Diprosin.

On the 2nd of August I drew off 44 ounces still bile-stained with more albumen than the last, and 1/2 numerous cells seen under the Microscope, which however made no difference to its fluidity.

14th August one pint more was drawn off by Aspiration, which showed after standing to contain 1/3 of pus.

22nd August 1/2 pint, the fluid very much the same as the last.

27th August 1/2 pint, bile-stained numerous pus cells, richly albuminous, no hooklets.
Before the third tapping, the patient's temperature rose to 103°, and only remained so for one day, otherwise he had no constitutional disturbance whatever.

He remained under my observation till the 6th October, and during that time there was no further attempt for the cyst to refill.

I communicated with the patient six months after and learned that there was no sign whatever of the reappearance of the swelling.

On the 17th October 1886, I aspirated a woman aged 47, for a large hydatic cyst of the liver, and drew off four pints of clear hydatic fluid. A large pad firmly pressed over the region of the cyst, was kept
constantly applied.

Two months after, 16th Dec.,
there was still some swelling over
the region of the tumour, but of a
hard, dense, character, and I was
unable to get any more fluid
with the exploratory needle. I
have not heard from the patient
since, and she promised to return
if the swelling reappeared. While
under treatment she had no con-
stitutional disturbance whatever.

I have recorded numerous
other cases (see Table of Cases) where
recovery resulted after one or
more aspirations, and very many
have been recorded in the
literature of the subject.
Dr Alexander Morrison, Melbourne, who was the first to strongly insist upon the pressure treatment, after tapping, maintaining as he did, that if the pressure was carefully attended to, it diminished the quantity of effusion which took place from the walls of the biliary cyst from removal of the tension of the contained fluid, while the frequent tapping prevented the tension reaching such a degree as to give rise to increased suppuration consequent on refilling of the sac.

(Australian Med. Journal 1883)

He also records a case at the same time, of a hydatid of the liver, where at the first tapping he drew off 130 ounces of heavy
yellowish, green liquid. A few days after, the tumour regained its normal shape. He tapped on six different occasions afterward and drew off quantities of fluid varying from 177 ounces to 43. His last tapping was almost dry. The cyst remained quiescent for four months, until after a violent attack of sea-sickness, the swelling reappeared, the contents of which were so thick when she again came under treatment, that it had to be treated by incision.

Dr Verco mentioned a case at the Branch Meeting of the British Medical Association, South Australia (British Medical Journal, May 18th 1886) where he drew off a gallon of
hydatid fluid from the liver of a patient, and where a year afterwards there was no trace of the tumour.

Dr. Macquillery (Hydatid odissea) cites the case of a young woman aged 23, where the cyst in the liver partly refilled a few days after he had withdrawn 11 ous of clear hydatid fluid, with numerous Scoles. Nine months afterwards there was no trace whatever of the Swelling.

In another case of a boy, a large tumour of the liver, entirely disappeared after one tapping.

Spencer Wells, Bulke, Jonathan Hutchinson have all testified to
the complete cure, which may follow simple tapping of hydratid of the liver. (British Medical Journal 1883)

The result of tapping is that the true cyst wall collapses, and falls away from the adventitia.

I have observed in Cases which have been treated by incision, that the cyst wall if it did not come away in pieces with the process of evacuation, it readily broke down into a fine granular debris, which passed off with the discharge from the cavity.

Possibly the same fate befalls the cyst when the tumour is aspirated, as I have noticed the
tendency to a Cundy deposit in cases where several tapings of the same cyst were brought about.

Fitzgerald (Birds' Hydatid of liver) noticed in a large hydatid of the liver, from which he had drawn four or five pints of fluid, in a patient who died three years afterward from Apoplexy, that the sac was dense, leathery, and shrivelled, without a drop of fluid in it. The same authority when examining the bodies of persons who had died from other causes, years after being tapped for hydatid has found cysts almost unchanged lying simply folded up inside a cavity and still remaining within the adventitia.
Kussmaul, in dealing with the treatment of hydatids (Korlue Klee Werkenschrift 1807) laid it down as a maxim "Not to wait on a case of growing Behinococcus of internal organs, until symptoms which arose threatened life; as a growing Behinococcus is a constantly threatening imme diate danger."

Unfortunately they do not as a rule come under treatment until they have attained a considerable size, and when their time of growth probably is a matter of years, so that the growing parasite has already lead to considerable pressure changes in the organ and tissues adjacent to it. There can be no doubt that as soon as they are observed they should be attacked.
in the most thorough manner as no natural limit to the life of the parasite can be determined and it may if left undisturbed, go on increasing to such large proportions as to impair the patient's life.

Hilton H Age (Practice of Medicine) recommends that a period of one year should elapse after a cest has been tapped, before it is interfered with again as by that time the hydatid will have shown whether it has any tendency to disappear. Such passive treatment however is only practicable when the patient is all along under observation, besides I have found as a matter
of experience that tapping, as soon as the cyst shows signs of refilling, reduces the chances of suppuration with its consequent dangers, besides leads to a speedier cure.

It may happen that the surgeon is rewarded only with a very small quantity of fluid in tapping a large hydatid cyst of the liver, the cause being due to the presence of daughter cysts. Before proceeding to further operative measures in such a case, he should be content to notice the effects of drawing off even such a small quantity.

Dr. Wilton Hind (British Med. Journal 1886) reports a case of
Hydatid in the liver of a woman aged 40. The dulness extended to two inches below and 3 inches to the left of the umbilicus shading off into the stomach resonance. There was great bulging over the area of dulness. He could only draw off 6 ounces of clear hydatid fluid no more would flow through the canula. For a few days the patient had a slight rise of temperature but it soon disappeared. He noticed the swelling getting less, about a week after the tapping, and in a month's time there was very little enlargement noticed. He saw the patient 3 years after and she
was quite free from her old trouble.

Dr. Venice Adelaide (Australian Med. Gazette 1875) is of opinion that cure from a single tapping is more common than is usually supposed and that the reappearance of the swelling may in some cases be due to the growth of a second cyst—small and insignificant at the time of tapping of the first.

The slow growth of hydatids however is against such a view, so is the altered nature of the fluid usually found in all subsequentappings.
Dangers

The simple process of tapping is not without its dangers. Cases have already been mentioned which had a fatal result from unforeseen circumstances as the piercing of a vein and the entrance of the fluid in the blood stream.

The mere shock itself is often very alarming, pain, vomiting and collapse are occasionally noticed and are very distressing. I have frequently observed persistent high temperature follow for several days after the evacuation of a cyst.
and subsequent tapping showed an entire absence of pus in the fluid.

Fresh hydatid fluid in itself is not necessarily an irritant, when it traverses into the peritoneal cavity, though the distressing symptoms often do seem to appear when there is a chance of its finding its way into the general cavity of the abdomen as for example after the tapping of a cyst. The question has never been seriously discussed whether the escaped fluid from the parent cyst in the liver is ever capable of giving rise to the development of secondary cysts.
in the part of the abdominal cavity where it may find a
lodgement.

Pearce Gould (Chaucer
Feb 4th 1867) makes reference
to a case where he performed
abdominal peritonitis for a large
suppurating hydatid of the
liver. A quantity of Omentum
was forced out of the wound
and was seen to be thickly
studded with aborted cysts,
the patient had been tapped
upon two previous occasions.
Under the head of Multiple
hydatids I have referred to a
case where I found some
portions of the Peritoneum thickly
studded with small echinococci,
the patient had been operated on
for a hydatid tumour of the liver some months previously.
Plate X, XI, XIV represents a condition found at the post-mortem examination and also a drawing from a microscopic section of one of the small echinococci. In the interior of the cavity was found boodlets, and the characteristic lamination of the cyst wall; the connective tissue of the cyst. Cyst was also well defined. There can be no doubt that these cysts developed from Scolices which in all probability found their way from the liver cysts after the operation.
It is not an uncommon thing in cases of multiple hydatid of the peritoneum to find one of the cysts growing in the region of the pouch of Douglas. At the Post Mortem of a patient who died from the effects of violent haemorrhage of the bowel, I found the cyst in the liver about the size of a florin, undergoing caseous degeneration, while there were numerous small ones in the great omentum, and one of considerable size between the bladder and rectum.

(Plate XLI.)

In the case of a young woman aged 18, who had to be operated on for dyspepsia arising from a large abdominal hydatid,
I found on going through the Hen's alba, midway between the umbilicus and the pubis, that the bladder presented itself to view being adherent to the abdominal wall from its being pushed up by means of a hydatid growing from the front of the uterus.

Hydatid Cysts at the most dependent part of the abdominal cavity are frequently referred to Verco (Australian Med. Gazette, 1886), Henricks' Lancet 1883, Norman Moore Lancet 1883. MacFellvary (hydatid disease) have all referred to their common existence in this region.
Treatment by incision

Treatment by free incision and drainage should be reserved for those cases where the contents have decomposed, or where they are of such a nature as to prevent them flowing through a suitable cannula, as is the case when the contents consist of daughter cysts, or where the fluid is thick and tenacious.

It has been shown that even when cysts are filled with daughter bladders mere tapping in some cases may so alter the vitality of the parent and its blood, that a cure may follow without further interference (Plate X vii).
shows two small hydatid in the lung of a patient who died from tumours of the brain undergoing degeneration and which were originally filled with daughter cysts.

In the case of a man aged 54 who had a swelling between the Paine and Scapula simulating a fatty tumour, but evidently growing beneath the muscle, and where the exploratory needle gave no result, proved in cutting down that it was a hydatid full of daughter cysts which with a few exceptions were empty and their collapsed walls lying against each other.

I have found at the post-mortem examination of one
patients suppurating hydatid cysts in the liver, which of themselves seemingly gave rise to no symptoms during the life of the patient. As a rule however they are sufficiently pronounced, and such cases constitutionally effect the patient, either from their persistent increase in size or from the effects of suppuration which is so apt to follow in some daughter bladders as they become overgrown in the parent cyst.

When the hydatid mainly grows in a downward direction from the under surface of the liver, the incision is best made at a point as near the upper boundary of the tumour as it is
possible to go without penetrating the pleural cavity. When from their position they pass mainly upwards, pushing before them the diaphragm, the mode of procedure is complicated with grave dangers, as the entrance of hydatid contents, especially if they be purulent, into the pulmonary region is often followed by an active attack of pleurisy to which the patient usually succumbs.

When a large cyst growing from the liver and passing downwards into the abdominal cavity has been freed of its contents, the natural tendency of the bowel which has been pushed to one side, to expand...
itself into its original shape, and thus tend to bring the surfaces of the cyst walls together. In such a case if the incision be not well over the base of the tumour, a valve-like sinus is apt to result which complicates the after treatment.

There are a variety of methods followed in opening into the cyst, the chief aim being to secure the adhesion of its walls to the abdominal parietes.

Barnwell (Surg. 1887) insists strongly in the security afforded by dividing the Operation into two stages when the steps of the Operation are similar to those of Gastrostomy.
or Calotamy. This method is a most invaluable one when the cyst is mainly on the upper surface of the liver, and where the surgeon has to deal with the proximity of the lung and the pleural cavity. For experience shows that a serious attack of pneumonia is apt to follow where a portion of the contents of a liver cyst pass into the area of the chest proper. (Plate II)

shows a hydrated of the liver which was opened by the direct method, and where the contents leaked into the pleural cavity. The patient, a woman aged 38, died from acute pleurisy 8 days afterwards. The incision
was made over the seventh interspase in the axillary line, and the wall of the cyst stitches to the parietes.

The dangers do not seem to be so great when the point for the incision selected is quite free of the chest cavity. The cyst wall generally can be easily and completely stitched to the abdominal wall. Such cases as a rule do well unless the patient sinks beneath the suppurative exhaustion that sometimes follows the operation of evacuation, especially when the aperture further serves to divert the stream of bile from its legitimate course.
Of the cases that I have had the opportunity of examining who were operated on in this way, and died from suppurative exhaustion, no inflammatory signs in the adjacent portions of the Peritoneum were noticeable.

Lawson Tait (British Med. Journal 1887) records a case (one of six performed in the same way) where he cut down on to the Cyst of the Liver Aspirated the fluid, then stitched the wall of the Cyst before opening the tumour.

Both Methods have been widely tried and both have given good results. The Operation by its two stages in Cysts in the Liver, where they...
do not involve the chest cavity is, as a rule unnecessary. In the cases where the hypodermic is freely movable, then adhesion can usually more simply be brought about by the insertion of six or 8 long hare lip needles placed perpendicularly over a selected area and left for a period of 8 or 12 hours while the abdominal wall is supported by strips of plasters as recommended by Fitzgerald (Heath's Dictionary of Surgery).

Hedley failed to obtain adhesion with 4 long Carbolat needles and Miceus even with a great a number as 40 to 60. (Freimoom Vol. iii) but as a rule 6 or 8 carefully and deeply
inserted should give a satisfactory result if left in for 8 or 12 hours.

The original method of obtaining adhesions before opening the Cyst is that of Simon, (Siemsen Vol. III) who first punctured the liver with a fine trochar and allowed the Cencula to remain for 24 hours. 8 days afterwards a second trochar was inserted at some distance from the former, and the 2 punctured wounds united by an incision, and the contents of the hydatid evacuated. There does not seem any object to be gained in waiting so long as 8 days and only 2 punctures are not sufficient.
to trust to, especially if the cyst is large and dragging.
In all cases where the hydatid has been opened by incision whether there be adhesions formed or not, it is advisable to push the cyst wall to the abdominal parietes with strong cat gut and in doing so it adds greatly to the comfort of the patient not to involve the skin in the sutures but to pass the needle obliquely through the muscle and to bring it out at the edge of the wound beneath the skin.

Hiedler and Hensen (Siem- mosen, Vol. III) modified Simon's method by puncturing first with a curved needle in order that the second might be made
from within outward, with the same instrument and the better prospect of a good result obtained.

Reamiers Method is to open the tumours by cautery by.
cavity. The external aperture is apt to heal before the cyst has become obliterate and thus lead to a reaccumulation of foetal contents. It is advisable to empty the cyst of its contents at once or as much of them as it is possible to get away with the aid of the forefinger. The bladder contents can be thus guided to the opening and pushed out. If left they rapidly undergo degeneration in which case it is difficult to keep the cavity sweet even with frequent irrigation. The parent wall should not be forcibly pulled away, unless it is found to have separated of its own accord.
The vesicles in the biliary cyst may be large and various, and the separation is sometimes followed by great haemorrhage; on the other hand, should it show any tendency to separate itself easily, then it is best to remove it.

Vervo (Australian Med. Gazette '86) showed a specimen to the South Australian Branch of the British Medical Association of a liver from a patient who died 5 days after abdominal section. The cyst had evacuated the whole of the right lobe of the liver, and over a considerable area its wall had come together by means of plastic adhesions. All the contents of
the hydatid with the primary cyst wall had been removed at the operation, and the Case and specimen maintained went to prove that a large cavity of this nature might be obliterated by primary adhesion in a very short time. Such a result is only possible when the parent cyst is removed and the adjacent walls allowed to remain undisturbed and not separated by forceful injection of fluid as is the case in the after treatment of hydatids, where the primary cyst wall has been left behind. In most cases the cyst wall has to be left behind, and irrigation becomes a necessity.
Various fluids are employed for this purpose all with the same object in view namely that of keeping the parts as aseptic as possible.

Weak solutions of mixture of Iodine, Boro flyceride, Chloride of Zine, Carbolic, Bonyt beli etc. In one case where perchloride of Mercury solution was used one in 2000, well marked Salivation was produced in four days. Mixture of Iodine added to tepid water till it assumes a light amber colour will be found to be most suitable and convenient form of fluid for irrigating the purulent hydrated oyster cavity.

It is enough to inject a
sufficient quantity of fluid, as will ensure a return of the collected debris, without distending the walls of the Cyst, which should be allowed to come together in order to hasten the obliteration of the Cavity.

A troublesome fistula frequently results even after the Cavity has become practically obliterated, and the application of the Salvarsan-Cautery with dull needles attached, generally brings about a healthy healing action.

The treatment of hydatids by means of electrolysis has not received a very popular place.
in the treatment of this disease.

The chief records of cases treated in this way, are those recorded by Hilton Fagge and Durham in the Medico-Chirurgical Soc. France 1871. In eight cases the tumours seemed entirely to disappear.

The mode of procedure is given as follows. Two electro-quilt needles were used which were introduced into the cyst at a distance of one or two inches from one another. Care was taken to observe that they had entered the same cavity and could be made to touch one another. They were then attached to wires connected with
the negative pole of a galvanic battery of ten cells, while the positive pole was made to terminate on a moistened sponge placed over the tumour at a little distance from the points of entry of the needles.

The current was allowed to pass for ten minutes, after which the needles were withdrawn.

It was thought that the saline fluid of the hydatid decomposed, and the parasite in consequence lost its vitality. But in several of the cases it was observed that symptoms similar to those which often follow the passage of cyst contents into the abdominal cavity resulted during the course of this treatment so that it is probable that the
disappearance of the tumour may have been due to the rupture of the parent cyst itself. No suppuration was ever noticed to follow in any of the cases treated.

There is always the element of uncertainty about this mode of treatment and there is no apparent benefit to be derived from it as compared with the more direct surgical method.

Hydatid in the Lung.

The subject of Hydatid of the lung has been ably and fully handled in the Works of Bird of Melbourne, and Thomas of Adelaide.
In the Capital of Victoria, according to Bird, it is found equally common in rich and poor alike, and as of frequent occurrence among the inhabitants of the city, as among the Shepherds of the West, or the Workers on the Bendigo Gold fields.

He ventures the opinion that the Ova of the Laccinia, tenacious of life as they are, find their way into the streets with the water laid on to allay the dust and with the great heat and frequent strong winds, are dried and blown about in the very air which the people breathe.

The probable cause of its common occurrence is most likely to be the water itself which the people so often drink without...
the precaution of seeing to its being filtered; otherwise it is difficult to account for the embryo being liberated from its capsule without such an aid as the digestive juice, and besides this development in the bronchi would be more common than is naturally the case, and the irritation which their presence there would set up would also lead to their early discovery.

Like cysts in the liver it is surprising how large they sometime attain, without causing any serious inconvenience to the patient.

In the case of a patient who first came under treatment for dyspnoea, which he had felt
For several months, but which did not prevent his following his usual employment as a bullock driver, I found, after his death, which suddenly followed the introduction of an exploratory needle, that the whole of the right lung was converted into a single cyst. (See Plate I xvi.)

I have found at the post mortem of a girl aged 16, who died from a tumour in the brain, two hydatid cysts on the right lung, each about the size of a walnut, filled with daughter cysts, and undergoing Casious degeneration. She had no chest symptoms whatever, and after repeated examination there seemed nothing unusual in the physical signs.
Andral (Clinique Medicale) relates the case of a woman aged 45 who died from uterine cancer. In the centre of the lower lobe of the right lung, he found a hydatid the size of a walnut containing numerous daughter cysts.

Geoffroy and Dupuytren (Bulletin de l'Ecole P de Medicine) record a case in each lobe of a voluminous cyst, extending on each side from the apex of the chest to the diaphragm. Each contained an enormous solitary hydatid, filled with about 6½ pints of fluid. The man died from pure loss of breathing space.

M. Cimperopoulou showed a
specimen of hydatid in the lung at the Paris Anatomical Society. (Chancet 1884). It was about the size of a large nut and undergoing degeneration. There was no symptom of its existence on the lung during the life of the patient.

Hydatids containing numerous daughter cysts, though by no means are however the exception, many of Cases of daughter cysts noticed in the expectoration of patients suffering from this affection, are no doubt pieces of the parent cyst wall while on the other hand the pleural cavity has been found full of daughter cysts, which had passed through the diaphragm, from the parent.
Cyst in the liver.

It appears that it is not uncommon for cysts of a small size filled with daughter bladders, to be found in the lung undergoing degeneration. I have come across two such cases and several others are recorded.

A large hydatid tenanted by a few daughter cysts is sometimes met with.

In one of Macgillivray’s cases (hydatid disease) an Indian had a hydatid of the lung tapped and 52 3\(^{\circ}\) of fluid drawn off. The patient died rather suddenly and the post mortem showed that the parent cyst contained the pae of a few moderate size ones, and
a few very small.

They are found on both lungs but have a preference for the right and are frequently situated in the lower lobe. They are also sometimes found at the apex.

There may be very marked bulging of the thoracic wall of the affected side.

In the case of a young child aged 8 (See Plate) the bulging of the right side was very pronounced, and was especially so in the anterior posterior direction.

The cyst seemed to extend throughout the whole area of the lung dulness, and was removed
by free incision. The child made a perfect recovery.

In the case of a boy aged 5 years, with a hydatid in his right Apet, the bulging was distinctly noticeable only over the area of dullness which extended to the nipple from the first rib. There was no lateral bulging whatever. The Apet was of 1/4 pint capacity, unbroken, and gave rise to little constitutional disturbance. It disappeared after the first tapping.

In the fatal case already referred to, where the whole lung was practically converted into 1/4th of a single Apet, beyond 1/16 in. of healthy lung tissue at the Apet, there was no deformity of the chest.
wall whatever.

Plate "XVIIa) is that of a patient who had a hydatid on the left lung, the size of a foetal head, where there was no deformity in the chest wall.

Hydatids in both lungs are met with occasionally, and multiple hydatids in the same lung have also been described.

Dr. Wilson Ghabebhaw (British Medical Journal 1880) records a case of a girl 6 years old, where at the post-mortem examination he found the Apex and Middle lobe of the right lung healthy, and a large hydatid at the lower lobe. Another Cyst occupied the whole of the
upper lobe of the left lung.

Bird (Hydatid of lung) refers to the case of a woman aged 36 who had unmistakable evidence of two hydatids in the same lung, one of which had burst the other was quite entire.

I have had under observation a woman aged 36 with a large hydatid in the right lobe of the liver growing downwards into the abdominal cavity. There was distinct symptoms of a ruptured cyst in the lower lobe of the right lung, and one in the left lobe.

In the pathological Society's transactions Vol. XV Peacock and Hicks record the case of a boy aged 18, with both lungs containing...
numerous hydatid Cysts, about the size of a horse Chestnut, or larger, embedded in cavities of the pulmonarv tissue.

The Cyst wall in pulmonary hydatid is as a rule but slightly adherent to the surrounding tissue. So much is this the case that in the radicular Operation for hydatid of lung, the wall either presents at the wound or is easily removed by gentle traction.

On two occasions I have noticed that the betweener was extremely slight and that the shell proper consisted of condensed lung tissue.

Burd (loc. cit. p. 13) states it as his experience that he has seen
old lung cysts with as thick an ectopic cyst as an apple in the liver; that in some cases where the cysts were not larger than an apple, they lay immediately in contact with the lung tissue.

In two small degenerated cysts found at a post mortem in the right lung of a patient, the ectopic in each case was of a thick tough nature.

Bourrier, (Hydatides On pomeau) mentions that at the post mortem of a patient, who died of meningitis, there was found a large hydatid in the lower lobe of the left lung, the fibrous capsule of which was formed by a cellular membrane along which projected the vascular branches denuded, and as it...
were dissected in a part of their course.

The diagnosis may be made almost certain if the loops has reached to the capacity of a pint or more. It has frequently attained to this size before the patient comes under treatment, as previous to then, the loops familial and slow growing as it is, generally escapes the attention of the patient and Casual Examination of the chest may fail to reveal the presence of anything unusual.

In some cases where the bulging of the chest wall is well marked, it is surprising
how slightly mconvinced the patient is, the deformity indeed may be the first sign that attracts attention to his condition, this was the case of a young girl aged 8, where the parents noticed her getting rather anaemic and where the arched appearance of the right apex lead them to seek advice.

The physical signs of Hydatids of the lungs, when the cyst is still unbroken, are usually easily defined.

Inspection shows a deficiency in the expansion of the affected side and the measurement is usually increased, but not necessarily so.
Palpation reveals an absence of fremitus over a well defined area, but it may be increased at a corresponding level, posteriorly, according to the amount of the lung tissue involved or compressed. Percussion gives an absolutely dull note to the exact limits of the cyst, and it remains unaltered by position. According to Bird (loc. cit. p. 17) 'peripheral fluctuation is sometimes obtained on percussion over the intercostal spaces in these subjects.' Auscultation reveals an entire absence of breath sounds if the cyst has developed sufficiently to approach the chest wall. If however some thickness of lung tissue intervenes between
the chest and the chest wall
the breath may be tubular in
its character.

The breath sounds beyond the
line of the chest may be perfectly
normal, if a puerile form of
breathing, in the lung tissue im-
mediately adjacent to the chest wall
nothing unusual may be heard.

The temperature may be quite
normal

The lung itself may be in
such a condition as to quite
alter the typical signs of
hydatid of the lung, pressure
on some large bronchi may
give rise to a constant intractable
cough, or there may be present a
low form of pneumonia, and I
I have also experienced the difficulty in diagnosing which the presence of pleurisy with effusion gives rise to, where it asserted as a complication of hydatid.

A careful diagnosis has always to be made between pleurisy localized, empyema, pulmonary abscess, phthisis and mediastinal tumours, but the history and condition of the patient will generally lead us to a correct conclusion.

In the ruptured eipst the diagnosis is rendered clear, by the character of the sputa. The patient usually has some
pyrexia and the physical signs are very much those of a phthisical
Vomica.

Even in cases of unruptured cysts there is often noticed a pinched
and anaemic appearance of the patient. Bird (loc. cit. p. 7) speaks
of it as a phthisical-like cachexia and is often noticed to exist with
clubbing of the fingers, and incurvature of the nails.

It has been seen to exist in cases where there was no evi-
dence of tubercle and often when the patient had got rid entirely
of the parasite, they made a perfect recovery.

(Plate 17 B.) is the drawing
of an aboriginal, who had this
noticeable cachexia, and who
made a perfect recovery, after the removal of a large hydatid of the left lung.

Thomas and Bird both refer to the variable degree of haemoptysis that is generally present in hydatid of the lung, before and after the rupture of the cyst.

I have noticed several cases run their course without this symptom. According to Stearn (Hyptes Hydatiques du poumon et de la pleure p. 24) only 1/6 of the cases collected by him were not accompanied by this symptom. A cough may exist for a considerable time, either of a short dry character or of a paroxysmal kind.
Graviner (Edinburgh Medical Journal 1837 p. 587) and Thomas (Hydatid of lung p. 18) have both referred to the marked Croupy Clamy which accompanies the cough in hydatid of the right lung, situated in the right apex. This however is so variable and uncertain a symptom that little value can be attached to it in the diagnosis.

Hydatids in the pleura are indistinguishable from those imbedded in the lung tissue, and are treated in the same manner. They are usually devoid of a sense of pressure acting as such.
Hydatid of lung

The treatment of hydatids of the lung presses more anxiously on the attention of the Surgeon, as the risks of non-interference, whether they be remote or immediate, are ever before him.

The cyst under the pressure of any extra effort or strain may suddenly burst and choke the patient. (Bird Hydatid of lung)

It may become converted into a pus cavity and develop in the adjacent tissue, a low form of Catemhal pneumonia, so that the patient's ultimate condition is one of phthisis.

Thomas (Hydatid of lung) gives the statistics of 113 fatal Cases of
pulmonary hydatid, and of these, only 8 died from phthisis which had supervened. He also directs attention to the interesting fact that in many instances a chronic supplicative process is produced in the lungs, while only in a few cases does it lead to a phthisical condition.

Burid (Hydatid of lung) states two cases by way of comparison showing that with patients likely to develop phthisis from an exciting cause, the certain presence of such a condition might hasten the condition. One case was that of a young woman, who seemed a likely subject to develop phthisis, was operated on for a hydatid of the lung, and eventually became
very strong; the other case, was that of a young man who could not be prevailed upon to submit to the operation, and who afterwards developed a true pulmonary affection; or fatal haemorrhage may ensue from degeneration of the blood vessels, on the wall cysts of the capsule (Thomas Hydatid of lung).

I have seen a case of pleurisy with effusion, which was evidently caused by the movement of the hydatid; the act of respiration irritating the pleural surfaces; clear fluid with hooklets from the cyst itself was drawn off, and ordinary serous effusion from the pleural cavity.
The patient may come under treatment for the first time either before or after the cyst has ruptured. As a rule, the tumour is within easy reach; it may be very large, and is sometimes attended with marked deformity in the chest wall. It is commonly monoeptioid and its walls readily separate from the surrounding tissues, as soon as the contents are set free.

The act of a simple exploratory puncture may be followed by serious symptoms.

In the case of an Australian Aboriginal (Plate 17a) who suffered from a hydatid in his left lung, the insertion of
a fine Hypodermic needle, caused him to give a sudden cough which was immediately followed with alarming dyspnoea, and the expectoration of mouthfuls of Hydatid fluid. Oscillations over the affected area, revealed Hippocratic Succession.

It was evident that the Cyst had ruptured, and that the contents were passing into a bronchos, and into the pleural Cavity. His distress was so alarming, that a free incision had to be made immediately through the Chest wall.

The fluid contents immediately gushed out along with the complete cyst wall, which was about the size of a foetal head. The patient
eventually made a perfect recovery and three months after the lung had expanded to its normal extent.

A strong and robust man sought advice for dyspnoea which he had felt for six months previously. The right lung was dull from base to apex, there was no bulging and an entire absence of breath sounds.

Immediately following the insertion of the needle, he gave a short sharp cough and then fell back and expired, a few minutes afterward.

At the Post-Mortem Examination the whole lung was found to have been converted practically into a hydatid cyst which had ruptured in the act of coughing.
and flooded the respiratory passages. (Plate XVa.)

Even the simplest act of exploring a hydatid of the lung should not be undertaken without the patient being forewarned and the surgeon forearmed.

He ought to be placed in the recumbent position and should be taught to resist for the time any involuntary attempt at coughing.

Dr Bird (Hydatid of Lung) explains the persistent and alarming cough, which is noticed to follow sometimes the tapping of a pulmonary Cyst, to the unavoidable piercing of a small bronchus by the Stilet, in its passage through the condensed
layer of lung tissue. At first all goes on as usual, and the fluid flows freely through the trocar, but as the pressure is removed, the bronchus becomes pervious and violent paroxysmal cough comes on.

Dr. Thomas (Hydatid Disease of the lungs) points out that the cough may arise, even when the needle traverses lung tissue, which from its condensed nature has practically obliterated its small bronchi.

In a hydatid of some size in the lung there are nearly always several large bronchi leading into the tissue comprising the immediate coverings of the cyst, and the cyst wall itself, being
usually easily separated from its surroundings, as soon as its intra-alveolar pressure has become altered. Collapse, and its fluid probably leaks into the lung cavity and is sucked up by the effort of the patient, causing his cough and dyspnoea.

It is highly important to attack the parasite in the lung as soon as it is diagnosed.

The surgeon should not be tempted to introduce an exploratory needle into the tumour to clear up his diagnosis, until the patient has been prepared and put to bed. An awkward Casualty might arise for example in a Consulting room, where one is often pressed to give a decided and accurate opinion.
Aspiration should be used where the contents are clear and flow easily. I have not observed the same tendency for the cavity to refill, as is nearly always the case in hydatid of the liver which have been aspirated. The compressed lung substance is enabled to expand and thus to speedily obliterate the cavity or to very much reduce its size.

Dr Bird (Hydatid of lung) records a case where it did refill a few days after tapping. He first drew off 144 3 oz of clear fluid, a few days after wards 84 3 more were withdrawn. Two months later 70 3 of foetid pus was taken off. and at the
same time an opening was made and drainage established.

Several months after the patient died from dyspnea and the lung was found to have completely expanded all round. A dense pleural adhesion. No trace of the hydatid remained.

Simple aspiration may be followed in pulmonary cysts, with complete cure, and without any symptoms of intercurrent complication as pleurisy or pneumonia.
Evacuation of the Cyst by free incision should be resorted to when the patient shows marked distress after an exploratory puncture, provided of course that the tumour is within easy reach.

After withdrawing some clear fluid from a hydatid, situated in the lower half of the left lung in a male patient, aged 29, the cough and distress for two hours afterwards was so alarming, that a free incision was made into the chest cavity and the whole Cyst completely evacuated. The breathing was at once relieved, and the patient slept peacefully and quietly all the night through.

The patient suffered from two
after current attack of pneumonia but after a Convalescence of three months was able to ride on horseback a distance of twenty-five miles.

Thomas (Hydatid of the Lung) states that in at least six cases that recovered after puncture, the cure really resulted from the expectation of the hydatid by natural efforts, after its rupture by Surgical interference. In such cases, however, the danger to the patient is often very considerable, and it usually can be reduced by an early incision if it is within reach, especially as the Cyst Wall itself, can be generally taken away en masse.
The size of the hydatid in the lung may sometimes determine the surgeon to adopt the radical treatment. (Plate XVIII) is the picture of a young girl aged 8 years, the left side of whose chest showed a well-marked bulging, from the Clavicle to the eighth rib. There was absolute dullness in front which remained unaltered in any altered position above the spine of the Scapula, the breathing was faintly tubular but below there was absolute dullness, and an entire absence of breath sounds. There was only trifling dyspnoea and a short hacking cough. From the extensive size of the cyst, it was thought
adviseable to treat it by a
free incision.

The Cyst wall came away
entirely. The patient for three
weeks suffered from an
attack of low pneumonia, but made a
most excellent recovery, regaining
almost completely the use of her
lung.

Such a case no doubt
could first have been treated
by simple aspiration, still the
size of the Cyst, 6 in diameter,
and the ease with which the
whole foreign body could be
got at, pointed to the radical
method as the speediest and
the safest.

In one case of a woman
aged 35 yrs, with a hydatid in the lower half of her right lung. I found the contents of such a thick, glutinous character that they refused to flow through the largest size aspirating needle. An incision gave exit to a large quantity of tenacious, stringy fluid. The cyst wall did not come away and the patient made an excellent though slow recovery.

The hydatid may present itself through an intercostal space, and pass up between the muscles of the chest wall forming a localized bulging tumour. Such a case was treated by Dr. Alexander Macomick (Sydney University) in a male patient aged 50. Its true form
was only discovered after the swelling was cut into, when it was found to be connected with a hydatid of the right lung. The patient's recovery was uninterrupted.

Hydatid contents may be found in the pleural cavity having made their way through the diaphragm, from the parent cyst in the liver. The presence of bile confirms the diagnosis in this condition. The prognosis in such cases is always grave from the hectic and exhaustion which is kept up from the liver source.

The incision about two inches in length is made along the line
of an intercostal space similar to that for empyema. The place selected is the centre of the cost where the pleural surfaces are most likely to be found adherent. A careful dissection is made down to the surface of the pleura, and the haemorrhage arrested before the serous membrane is pierced. If the intercostal space is found practically obliterated by the close proximity of the adjacent rib, a portion of rib should be removed in order that a large sized drainage tube may lie with ease. If adhesions are present so much the better, but their absence should not deter the surgeon from completing the
Operation. The hydatid may practically have no special covering, the serous covering often being their only &icr;&excl;teroicp. In hydatids of the peritoneum on the other hand, the &icr;&excl;teroicp is generally found to be a tough fibrous membrane.

The Cyst should be laid hold of by a suitable pair of forceeps before it is opened, and then held close to the mouth of the wound, while its contents are pro-pelled. Gentle traction will generally cause the whole hydatid to protrude in one entire mass. If not it should be left alone, when probably in a day or two it will be found protruding.
Dr. Bird (Hydatid of the Lung) recommends dilating the opening with a sponge tent to favour the formation of adhesions; after leaving in the cannula for some time these forcibly dilating the opening with the little fingers and a pointed instrument.

This however delays the treatment which when once commenced should be carried through as effectually and quickly as possible.

The position of the aper as when it is situated about the apex of the lung requires greater care on the part of the surgeon. When in this position the formation of adhesions is a much more serious matter.
Dr. Thomas (Hydatids of the Lung p. 607) records the case of a young lady aged 20 years, with a moderate sized unruptured hydatid in the upper lobe of the right lung at the aper. An exploratory puncture was followed by urticaria and pyrexia. A month later a large trocar was deeply inserted into the second interspace. The patient died a few days after from pneumothorax.

A large size India rubber drainage tube should be introduced not too deeply so as to avoid inverting the lung. The opening should be covered with absorbent salicylic wool. The wound is apt to contract before the cavity has become obliterated, so that it
is well to have the drainage tube as large as possible.

As a rule, it is not desirable to irrigate the cavity unless the odour and discharge is very offensive. In such a case a gentle stream of plain tepid water will be found enough.

Peritoneum.

In the Peritoneum they generally occur as multiple cysts: the large and small omenta especially, are favourite seats for their development. Unlike the hydatide in the serous membrane of the lungs and brain they are characterised by a tough, fibrous body.
Plate vii represents a specimen where the whole gastrohepatic omentum was converted into one large cyst with numerous daughter cysts.

The large omentum may be studded with echinococci of different sizes (Plate IX). Frequently they are found not larger than a walnut or small orange, and may number several dozen (Plate IX).

In the mesentery, a cyst may form for itself an attenuated and twisted pedicle (Plate XI).

The recto-vesical pouch is a common nidus for them. There are many such cases on record. Plate shows one in situ from a patient who died of multiple...
hydatids. Verco (Australian Medical Gazette 1886) mentions
a case where he found one between the rectum and the bladder,
and extending down into the perineum. It had stripped the
peritoneum completely from off the bladder. The patient could
only retain urine a short time.
The catheter could not pass beyond a small cavity just beyond the prostate.

In a case reported by Bright (Memoirs of abdominal tumours) the post
mortem showed that the catheter passed by an opening from the urethra
behind the bladder into a large hydatid cyst, attached to the posterior part
and fundus of the bladder, and preventing it entirely from filling
with urine.
In the case of a young woman who was operated on, a hydatid which greatly distended the abdominal cavity. The incision through the linea alba, two inches below the umbilicus, passed into the bladder, which had become adherent to the abdominal wall, from its being pressed up by a large cyst growing from the front of the uterus. The patient for weeks after she was able to go about had a protrusion opening in the abdominal wall, through which urine trickled.

Dr. Mac Gillivray records an interesting case [Hydatid disease] of a patient who died from pneumonic, and where the post Mortem examination
showed a swelling in the Scrotum which was due to a hydatid Cyst, developing in a process of the Omentum and preventing its return. In all probability the parasite was trifling in size, when it descended with the hernia, and had enlarged in this region.

Dr. Buckett of Sydney (Australian Medical Gazette 1886) found a Cyst in the Scrotum, simulating a hydrocele, and about the size of an Eunuc's egg, and when after tapping with a large trocar, the Cyst Wall protruded itself through the aperture.

They sometimes distend the abdomen to an enormous extent (Plate XIX) is that of a woman aged 34, with a large movable
tumour which was growing so far as the diagnosis could be made out, from the great Omen-
tum. It was mono-cystic, and 114 pints of clear hydatid fluid was aspirated from it and 10 and 8 pints of serous fluid subsequently. She was discharged strong, in health with a hard globular mass taking the place of her large tumour.

In three cases (1) that of a
man aged 45. (2) a young woman of 19. and a girl of 11.
I was unable to get any tympanic note from the liver margin to the pubis. There was great distension in each case. A free incision in the lower abdomen gave relief to hundreds of
daughter Cysts, and the great
cavity of the Mother Cyst, shut off entirely the abdominal Viscera.
Plate XII a is that of a Cyst situated at the junction of the large and small intestine containing four daughter Cysts.
They may also be found growing from the parietal layer of the peritoneum but not so commonly as in the situation already described.

The Kidney & Supra Renal Capsule.

Hydatids of the Kidney are by no means rare, and they are sometime met with in this organ when the rest of the body is entirely free.
It is the most common parasite that attacks the kidney, and it may have attained considerable size, before the patient suffers any inconvenience.

When they develop in the Medullary Cavity, they seldom reach a large size and have a tendency to rupture into the Renal Pelvis (Lienau Vol. 11).

Its slow growth gradually accustomed its neighbors to accommodate itself to the needs of the economy.

(Plate XIII B ) is from a case of multiple hydatids, where one has developed from the serous surface of the kidney.

They are rarely found between the capsule and the gland, most
commonly they are situated in the renal tissue, and may grow to such a size as to finally destroy all the kidney substance. When they develop from the substance of the Cortex, they attain to their greatest size.

There is usually a thick film or Capsule, as is generally the Case of Hydatids of the abdomen which may be highly vascular.

The Hydatid may be simple, or contain numerous daughter bladders. They may reach down into the Plice fossa, and up to the Diaphragm, and may in consequence be difficult to distinguish from a Cyst of the liver or the abdomen, they may also be confounded with carcin tumours.
The diagnosis is only made certain when the contents are found to be voided with the urine. They may also rupture into the chest cavity and be expelled through the bronchi in which an unusual odour has been noticed with the expectoration.

Two thirds of the recorded cases opened into the pelvis of the kidney, and the symptoms in most cases were similar to those experienced in renal colic: pain of a sudden and excruciating character, darting down the hip and thigh, vomiting, retraction of the testicle, with some blood in the urine.

In these cases, the swelling has disappeared gradually, and frequently spasmodically.
Whole bladder cysts may be passed by the urethra, and in a case recorded in Ziemosen, the patient (a woman) suffering from retention, extracted by her own fingers, a cyst which was blocking up the urethra.

Daughter bladders may perchance rupture into the bladder from hydatids of the abdominal cavity, but such a termination as far as I have been able to ascertain is rare.

The termination is generally a very favourable one, when they rupture into the pelvis and the contents become expelled per urethra, the complication of pyelitis may supervene, after the expulsion
of the parasite, and delay the recovery.

Schistosocci in the Supra-renal Capsule is very rare. There is a case of Weber's referred to in Zeitschrift Vol IV of a patient aged 68 who had a severe attack of pain in his right hypochondromac region. Six years previously he was taken ill with loss of appetite, severe pain in the right hypochondrium, and great weakness.

He died from extreme exhaustion. The post mortem showed that the right supra-renal Capsule had been transformed into a tumour the size of a Walnut. This had a fibrous Capsule and a central
ulcerated cavity. The tumour was evidently one of a multilocular form.

Plate XIII c 1 is that of a hydatid replacing the suprarenal capsule. In shape it very much resembles the appearance of a cocked-hat. It contained no daughter cyst. The patient, a male, was deeply jaundiced and anaemic and though he was the host of numerous hydatids in the abdominal cavity, there was no pressure in the bile ducts to account for the jaundice.
Echinococcus Multilocularis

This form of hydatid is found chiefly in man and generally in the liver.

Huber (Jahresber. d. Naturhist. 1867) has also described it in the chest and in the region of the suprarenal capsule (Deutsche archiv. f. d. Klin. Med. 1867 p. 613).

It differs from the other forms, in being composed of a group of very small bladders which lie near each other and embedded in a stroma.

In appearance it resembles a new growth of a form consistence, of all different sizes up to that of a foetal head.

On section numerous small
cavities are found in the interior, with gelatinous contents.

Its parasitic nature was never thought of till Virchow showed the echinococcus contents.

(Verh. der Würzburger phyts, Med. Gesellsch 3d in 1866)

It has a tendency to ulcerating which usually commences in the stroma and which leads to the death of the parasite.

Leuckart (loc. cit. p. 624) states that occasionally in this form one can notice issuing from the tumour a number of white cords making their way into the adjoining liver parenchyma and becoming new foci of echinococcus formation.
The bladders exhibit the characteristic laminated structure, and in the great majority of them, the heads are never developed. Marie prowseansky of Zurich found one in which half the bladder, both large and small, were provided with heads (Leuckart loc cit p 628.)

The bladders are not usually spherical, they are either indented or constricted in the middle and in some have protrusions which project like bemi-

Leuckart (p 629) is of opinion that the buds develop from succedated masses of parenchyma. The new bladders seldom remain
within the annular space occupied by the mother (though
Veychur and Schles have
observed them in some cases (loc.
cit p. 624)).

They pass usually into the less
compact stroma, which soon
presents an appearance as if the
inhabitants had originated
within it.
Brain

The echinococcus is found in the brain in all its parts, and it is also found in the membranes. It does not usually attain to any notable size on account of the fatal issue that it speedily brings about. In some cases it is surprising how much brain tissue may be displaced by such a tumour without giving rise to any marked impairment of intellect.

Mr. Hankins, Sydney, described to me a case which came under his notice in 1883, the full note of which he published in the Australasian Medical Gazette, January 1883, where the patient, a butcher boy, aged
18 years. Died suddenly.

He had been subject to epileptic seizures, and for some time previous to his death, complained of severe pain at the back of his head, and a fulness at the back of his throat. He was bright and intelligent, played the violin and sang, etc.

He died in one of his seizures. The post mortem showed that portion of the parietal bone on the right side was very thin and almost transparent. The membrane were normal. At the back of the right posterior lobe, the nerve tissue had given way and from it was seen protruding the white cyst wall of a hydatid. There was no other cyst, it lay an immediate
contact with the brain substance, which at one place in its upper surface had quite disappeared. The specimen was egg-shaped, and measured 3 in. in its longest diameter and 2 in. in its shortest, attached to its inner surface were a few small pea-like vesicles but not detached from the Cyst Wall.

Dr. Allen, Melbourne Hospital has recorded notes of an interesting case which is quoted in Godsell's "Parasite of Man" (p. 141) where the patient a lad aged 15, began to lose power in his left arm and leg for eight weeks before death. During this time he had every week an attack of severe headache—and once he lost all sight
for over half an hour. The day before his death, he was able to walk with help.

At the post mortem, a large cyst about four inches in diameter was found in the mid convexity of the right hemisphere of the cerebrum, slightly towards its anterior part. It formed a marked prominence in the anterior surface of the brain. The pia mater was not thickened nor adherent to the dura mater. The interior of the cyst was studded with little granular prominences, some pellucid, some opaque white. The brain tissue around presented scarcely any induration.

In some cases, the roof of the
Skull becomes absorbed, and the parasite grows beneath the scalp, it may also extend into the nose and orbit.

The symptoms are almost identical with those of cerebral tumour. One may be disappointed even in cases, where the history, eye and general symptoms might lead fairly to expect the presence of hydatid in the brain.

In one case of a young girl, who had complained of severe attacks of headache, for over a year, with nausea and vomiting, and who for the last 2 months before her death, had completely lost her sight but retained her sensation and motion. I fully expected to find a hydatid at the post Mortem Examination. She was
16 years of age, strong, and well nourished. The district where she lived was distinctly a hydatid one; the probability of syphilis was quite excluded.

I found a solid tumour about the size of a Walnut involving the substance of the Callosum in the left hemisphere, of the nature of a Glenn. I also found 2 small benignoeei in the right lung, where during life there was no evidence of their presence.

In most of the cases described, the symptoms are chiefly headache, of a violent and paroxysmal kind, dizziness, vomiting, Syncope, and spasms of an Epilepticom nature, occasionally only disturbance of the...
Motor, and sensory functions are observed. In one case (Ziemssen Vol. III) a facial neuralgia was the only symptom present, where the cyst was situated in the right central hemisphere and about the size of a cow. The same authority states that Westphal makes a special point of the intermitence of the symptoms with now and then an intensified recurrence.

The diagnosis can only be verified in these rare cases where it reaches some accessible locality as for example, when it reveals itself externally through the skull. In which case the treatment is by drawing off the fluid by a fine needle, and replacing the needle with a small drainage tube.
The usual medicinal remedies should be tried, as the Iodide and Bromide. In regard to the latter drug especially it is surprising the relief the patient experiences from its use in large doses.

**Spinal Cord**

In this region the parasite is comparatively rare and unlike the hydatids in the brain, it generally develops outside the membranes. It may force its way from without into the vertebral canal by widening the intervertebral foramina, or it finds an entrance into the canal by absorption of the vertebral. By Prokoff in the hance for...
1887, report a case of impetigo, where the patient first noticed a tumour in the back to the left side of the vertebral column. There was loss of motion in the lower extremities, pain in the joints, oozing articules, rheumatism, loss of sensation followed with retention of urine and constipation. The patient gradually sank and died when there was found about 100 daughter cysts with a quantity of fluid. Compressing the cord opening into the canal from a hydatid tumour developing in the muscles of the back.

Guys' Hospital report for 1870, contains the note of a case where the hydatid had crowded out the vertebral canal anteriorly
to the right and left into the pleural cavities, and also
by numerous ramifications into the muscle of the back, pos-
teriorly. The diagnosis from these tumours is very different and the cases so far recorded have been followed by a fatal result.

Spleen

Hydatido of the Spleen are not infrequent.
They may be entirely confined to that organ, but generally cysts in the liver are at the same time present.
They are usually only noticeable from their bulk, which gives a
feeling of fulness and weight at the place where the tumour has developed, and also from the mechanical pressure to the stomach which they give rise to there may be added the symptoms of gastric irritation. Pain may be the only symptom that leads to the detection of the parasite. In the case of a young woman aged 26 who complained of severe pain under the floating ribs of the left side, there was nothing to be seen or felt. The pain was such that the patient was persuaded that a rib must have been fractured over that region, from the result of a knock which happened to her some months previous to her seeking relief. The area of fulness of the spleen was only
slightly increased. On her taking a deep inspiration, a cystic swelling could be felt descending over the region of the spleen. By inserting an exploratory needle into it I drew off nearly a pint of clear fluid containing Scolecis and brood capsules.

In most cases there is comparative slight disturbance to the general health and the differential diagnosis between acute case, and solid tumours of the Spleen, is usually easily established.

Dr W. Pape (British Medical Journal 1880) mentions a case of a patient aged 39, who had a hydatid in the lung and the Spleen, and where death took
place suddenly in attempting to clear the throat of some shreds.

The post mortem showed at the apex of the left lung, the remains of a hydatid of a considerable size, and the spleen which measured 9" long, 6" broad and 4" thick, was filled with daughter cysts of different sizes.

There was no cyst in the liver.

In Bone

Hydatids are sometimes found developing in the medullary canals of large bones.

From mere pressure they are occasionally found to break their way through the bones of the
Skull, chest and vertebral column, but their presence in the shaft of large bones may only be detected from a fracture either spontaneously or resulting from a slight injury, or in the Operative treatment for long standing necrosis.

Reekhart (parasite of man) mentions a case of Dupuytren's, where a patient had a hydatid in the medullary cavity of the humerus, and where the latter broke after the simple act of throwing. It may break through at one point and spreading among the surrounding muscular tissue complicate the diagnosis.

Dr. Coppinger, Belfast (British Medical Journal 1887) had a
patient under observation for 3 years for Sclerosis of the femur. He made an incision over the trochantur and scraped and washed out the necrosed sinew. In the contents he found granular debris and numerous Scotoes.

Dr. Leacock of Camden N.S.W. reports a case (Australian Medical Gazette Novr. 1887) of a young patient of his, aged 12 years, who could only give the history of having received a kick over his left knee-joint. For seven years he had inability to straighten it properly. The joint was painful and enlarged. There were no signs of suppuration and but little effusion. There was often severe pain at night, and the patient's health was breaking down.
An operation with a view to resection or amputation was undertaken. The cartilages were found slightly eroded, and there was a perforation admitting the tip of the finger into the femur. Otherwise there seemed nothing amiss with the joint. On sawing through above the condyles the bone was found to be a mere shell in some parts to be scarcely thicker than paper, and the cavity crowded with hydatid cysts, from the size of a small pea to nearly that of an inch in diameter.

Laudone (Archiv f. f. Zahn-Kaalgie) records a case of a hydatid of the right side of the chest where there was complete destruction of the ribs in the parasternal line, over an
area of about 3 ce square.

Dr. John Ogilvie (Path. Soc. Trans. Vol IX p. 299) records a case which originated in the spinous process of the 7th cervical vertebra, and projected into the spinal canal.

Dr. Thomas Adelaide British Medical Journal Sept. 1886) refers to a case where the primary seat was in the right iliac.

Cooffold (Parasite of man p. 134) refers to the collection of hydatids in St. Thomas Hospital Museum, and especially to that of a humerus taken from a man aged 34 years, where the shaft is occupied throughout by small hydatids that have destroyed almost all the cancellous structure. In some places there was little more than periosteum left,
There are also 2 preparations by Mr Travers, from a man aged 38 years of age, in whom numerous small hydatids occupied both the head of the Tibia and the lower end of the Femur. They freely communicated with the knee joint necessitating amputation of the limb.

Eye and Orbit

The hydatid has been observed in the interior of the eye and associated with complete loss of sight. More frequently it is found in the orbit. Macquillany records a case
(Hydatid disease) of a patient aged 40, where 6 years ago felt something wrong with his right eye. It protruded a little and turned up. The sight was limited to the perception of light. A tense fluctuating tumour could be felt beneath the lower lid. Nine dark blue paras were evacuated, the largest one weighed half an ounce.

Dr. Foss Adelaide records the case of a lad aged 17 (Australasian Medical Journal 1883) where the eye was prominent and pressed downward and outwards to temporal side. Patient's sight was only partially affected. The opthalmoscopic examination showed that the veins were dilated, the arteries small and pale, the optic
dis is hazy and their outline indistinct. On opening it a few daughter cysts the size of fists escaped.

The majority of the cases recorded have resulted in the destruction of the eye.

Breast, Arilla, etc.

They are occasionally met with in the breast, and their size and appearance may baffle the most careful attempt at diagnosis.

In a case of cancer of the breast, Bandelin and Alphaden mentioned two cases of women the former of whom had a tumour in the right breast about the size
of a hen's egg. It had a hard elastic feel. The patient had felt it for 14 years, when it was first noticed. It was the size of a hazel nut. The exploratory needle gave no positive result. On cutting down on it, he found it to be a hydatid cyst containing putty-like material of a hydatid nature. The other case was that of a woman, with a deep seated lobulated swelling in the right breast of a hard feel. The skin over the most superficial part of the swelling was retracted, and adherent. There was considerable pain at times, but no affection of the axillary glands. It was subsequently found on incision to consist of a hydatid
wit & daughter Cysts, the largest
the size of a pigeon egg.

Macquillany (Hydatid Disease)
has also recorded a case situated
in the atrium, which lead to slough-
ing of the atrium artexy and fatal
hemorrhage.

A similar case is referred to
in a paper read by Dr. Muskett,
Sydney (Australian Medical Gazette
1886) where the patient was a
young child.

In the subcutaneous tissue they
are not infrequently met with, but
this position leads to their discovery
and complete removal.
Hydatids are sometimes found in and around the heart.

Dr. Bird (Medical Times and Gazette, August 1873) found a hydatid filled with daughter cysts, occupying the whole of the outer surface of the heart, extending from the upper surface of the auricles, surrounding the large vessels. Some of them were the size of small oranges. They seemed to have arisen in the visceral layer of the pericardium, not encroaching much into the muscular substance. The cavities of the heart were untouched by the parasite.

Brodribb (Chancer 1837-38 p 628) records the case of a lad, the right ventricle of whose heart was so
Appendix To

and

Synopsis Of

A Clinical Study

Of

Hydatid Disease

By James Graham, M.A., M.B. C.M.
In this Thesis I have embodied my own experience of Hydatid Disease, derived from exceptional opportunities of studying it while in Resident Charge of Prince Alfred Hospital, Sydney, N.S.Wales.

The illustrative plates have all been carefully drawn from specimens that I procured at the post mortem examinations of patients who were under my own care and treatment. A few it will be seen are from the living subject and serve to illustrate different points of clinical interest fully referred to in the Treatise.

They are all represented in life size, with the exception of
plate No. IVA. and V., which are drawn from microscopic section.
Every care has been taken to
depict naturally and faithfully
the true condition of the different
specimens.
Each plate is accompanied
with a short descriptive note on its
opposite page.

The Thesis comprises
1st. A short historical account of the
Hydatid with a description of the
meaning of the various terms that
have from time to time been applied
to its various forms. (Page 1 to 7.)

2nd. The Taenia Solium, its habitat,
age, appearance &c., with the views
of Leuehart, Kuechenmeister, Cobbold, etc. and an account of my own experience of its occurrence in stray dogs of Australian cities (page 7 to 10)

3rd. The proportion of dogs affected, and the direct source of propagation of the echinococcus, and the annual death rate of persons dying from this disease in Australia (page 10 to 19)

4th. Situations of Hydatids, their rate of growth, maturity etc. (page 19 to 31)

5th. Daughter cysts with an account of their development and degeneration (page 31 to 42)
Multiple Hydatids

Mode of development quoted full particulars of a case where the lowest portions of the peritoneal cavity were studded with small cysts, evidently arising from Scolexes from a parent cyst in the liver which had been tapped 3 months before.

Hitherto there is no direct evidence published which in any way demonstrates this mode of development though it has been anxiously looked for (see Lancet 29th 1887).

Plate XIX clearly demonstrates the true nature of cyst which developed in this way with its laminated membrane and hooklets.
Plate X IV shows them lying in front and behind the uterus in great numbers. Plate X also shows them developing from the great omentum.

The importance of this clinical fact is very great as demonstrating a new and formidable element of danger in the treatment.

(page 43 to 51)

7th Several symptoms and subjective symptoms of patients affected.

(page 51 to 58)

8th Diagnosis age of patient affected etc (Page 59 to 66)

9th Hydatid Fluid. Its character and contents viewed as an aid to diagnosis of the
particular organ where the cyst is located. (Page 66 to 72)

Hydatid Raco

An experimental enquiry into its cause. A summary of Professor Koj's experiments in regard to poisonous symptoms arising from absorption of hydatid fluid in the blood stream, with an account of my own experiments in dogs as to its action on the peritoneum etc. (Page 75 to 91)

A full account of all the methods of treatment of hydatids generally, and of the liver especially, with numerous illustrative cases, from my own experience and from recorded cases. (Page 100 to 160)
Hydatid of the lung, with a full description of their position, varieties, and treatment. (Page 160 to 202)

Hydatids in the peritoneum and their varieties and treatment with numerous illustrative cases. (Page 202 to 206)

In Kidney and Supra-Kenal Capsule (Page 208 to 211)

Echinococcus Multilocularis (Page 215 to 218)

Hydatid of Brain and Spinal Cord (Page 219 to 228)

Hydatid of Spleen. (Page 228 to 231)

Hydatids in bone. (Page 231 to 236)

Hydatid in Eye, Orbit, Breast, Arilla, Heart and Sub-cutaneous tissue. (Page 236 to 243)
# Cases of Hydatid Treated

<table>
<thead>
<tr>
<th>No.</th>
<th>Sex</th>
<th>Age</th>
<th>Name and Occupation</th>
<th>Situation</th>
<th>Operation</th>
<th>Remarks</th>
<th>Result</th>
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<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>18</td>
<td>A. R.</td>
<td>Liver</td>
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<td>Re-filled</td>
<td>Complete recovery</td>
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<tr>
<td>2</td>
<td>M</td>
<td>23</td>
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<td>Liver</td>
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<td>Re-filled</td>
<td>Complete recovery</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>41</td>
<td>Gold-Miner</td>
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<td>Aspirated</td>
<td>Re-filled</td>
<td>Complete recovery</td>
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<td>4</td>
<td>M</td>
<td>24</td>
<td>M. B.</td>
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<td>Aspirated</td>
<td>Re-filled</td>
<td>Cured</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>29</td>
<td>B. E. L.</td>
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<td>Re-filled</td>
<td>Cured</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>25</td>
<td>B. M. G.</td>
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<td>Re-filled</td>
<td>Cured</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>21</td>
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<td>Cured</td>
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<td>8</td>
<td>M</td>
<td>15</td>
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<td>Cured</td>
</tr>
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<td>M</td>
<td>29</td>
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<td>Re-filled</td>
<td>Complete recovery</td>
</tr>
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<td>Re-filled</td>
<td>Complete recovery</td>
</tr>
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<td>33</td>
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<td>Re-filled</td>
<td>Complete recovery</td>
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<td>Complete recovery</td>
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<td>Complete recovery</td>
</tr>
<tr>
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<td>M</td>
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<td>Re-filled</td>
<td>Cure</td>
</tr>
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<td>M</td>
<td>31</td>
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<td>Refilled</td>
<td>Cure</td>
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<td>M</td>
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<td>Re-filled</td>
<td>Cure</td>
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<td>Re-filled</td>
<td>Cure</td>
</tr>
<tr>
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<td>M</td>
<td>44</td>
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<td>Aspirated</td>
<td>Re-filled</td>
<td>Cure</td>
</tr>
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<td>No.</td>
<td>Sex</td>
<td>Age</td>
<td>Name and Occupation</td>
<td>Situation</td>
<td>Operation</td>
<td>Remarks</td>
<td>Result</td>
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</tr>
<tr>
<td>19</td>
<td>m</td>
<td>30</td>
<td>A C. Surveyor</td>
<td>Livers</td>
<td>Aspirated</td>
<td>Did not re-fill</td>
<td>Cure</td>
</tr>
<tr>
<td>20</td>
<td>f</td>
<td>22</td>
<td>Servant</td>
<td>Livers</td>
<td>Aspirated</td>
<td>Did not re-fill</td>
<td>Cure</td>
</tr>
<tr>
<td>21</td>
<td>f</td>
<td>32</td>
<td>Dom. But. J H</td>
<td>Livers</td>
<td>Abdominal Section Deeply寒假ed; Ap. 8</td>
<td>Died from exhaustion</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>m</td>
<td>43</td>
<td>Stocktoster M J</td>
<td>Livers</td>
<td>Abdominal Section</td>
<td>Numerous Daughter Cysts</td>
<td>Complete recovery</td>
</tr>
<tr>
<td>23</td>
<td>f</td>
<td>29</td>
<td>Dom. But. T M S D</td>
<td>Livers</td>
<td>Aspirated 105 Pints</td>
<td>Did not re-fill</td>
<td>Cure</td>
</tr>
<tr>
<td>24</td>
<td>f</td>
<td>23</td>
<td>Dom. But. M C V N</td>
<td>Livers</td>
<td>Aspirated Drawn refilled once</td>
<td>Complete recovery</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>A</td>
<td>11</td>
<td>School Girl B D O</td>
<td>Livers</td>
<td>Abdominal Section</td>
<td>Numerous Daughter Cysts</td>
<td>Complete recovery</td>
</tr>
<tr>
<td>26</td>
<td>m</td>
<td>25</td>
<td>Laborers M H</td>
<td>Livers</td>
<td>Aspirated</td>
<td>Refilled &amp; times not determined each time 20 oz removed</td>
<td>Refiller twice</td>
</tr>
<tr>
<td>27</td>
<td>m</td>
<td>47</td>
<td>Laborers H J</td>
<td>Livers</td>
<td>Aspirated</td>
<td>Refilled &amp; times not determined</td>
<td>Cure</td>
</tr>
<tr>
<td>28</td>
<td>f</td>
<td>37</td>
<td>Dom. But. A M Clerk</td>
<td>Livers</td>
<td>Abdominal Section</td>
<td>Remove Contents</td>
<td>Cure</td>
</tr>
<tr>
<td>29</td>
<td>m</td>
<td>16</td>
<td>Clerk M T K</td>
<td>Livers</td>
<td>Aspirated</td>
<td>2 Pints refilled Twice</td>
<td>Cure</td>
</tr>
<tr>
<td>30</td>
<td>f</td>
<td>27</td>
<td>Dom. But. F G</td>
<td>Livers</td>
<td>Aspirated</td>
<td>2 Ounces withdrawn</td>
<td>Tumour gradually disappeared</td>
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<tr>
<td>31</td>
<td>m</td>
<td>20</td>
<td>Boot Maker W D Clerk</td>
<td>Livers</td>
<td>Aspirated</td>
<td>3 Pints did not refill</td>
<td>Cure</td>
</tr>
<tr>
<td>32</td>
<td>m</td>
<td>36</td>
<td>Clerk J G</td>
<td>Livers</td>
<td>Aspirated</td>
<td>3 Ounces did not return</td>
<td>Cure</td>
</tr>
<tr>
<td>33</td>
<td>m</td>
<td>20</td>
<td>Laborers P L</td>
<td>Livers</td>
<td>Aspirated</td>
<td>A few ounces</td>
<td>Cure</td>
</tr>
<tr>
<td>34</td>
<td>f</td>
<td>22</td>
<td>Dom. But. T J</td>
<td>Livers</td>
<td>Aspirated</td>
<td>4 Pints purulent fluid</td>
<td>Cure</td>
</tr>
<tr>
<td>35</td>
<td>m</td>
<td>20</td>
<td>Laborer M K</td>
<td>Livers</td>
<td>Aspirated</td>
<td>2 Pints dark fluid</td>
<td>Cure</td>
</tr>
<tr>
<td>36</td>
<td>m</td>
<td>20</td>
<td>Saddles</td>
<td>Livers</td>
<td>Aspirated</td>
<td></td>
<td>Cure</td>
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<td>Age</td>
<td>Occupation</td>
<td>Situation</td>
<td>Operation</td>
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<td>Result</td>
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</tr>
<tr>
<td>39</td>
<td>M</td>
<td>18</td>
<td>Servant</td>
<td>Liver</td>
<td>Aspirated</td>
<td></td>
<td>Died</td>
</tr>
<tr>
<td>38</td>
<td>M</td>
<td>28</td>
<td>Labourer</td>
<td>Liver</td>
<td>Aspirated</td>
<td>Did not refill</td>
<td>Cured</td>
</tr>
<tr>
<td>37</td>
<td>M</td>
<td>32</td>
<td>Labourer</td>
<td>Liver</td>
<td>Section</td>
<td>Great Expectoration follow</td>
<td>Cured</td>
</tr>
<tr>
<td>40</td>
<td>M</td>
<td>32</td>
<td>Dom. But.</td>
<td>Liver</td>
<td>Aspirated</td>
<td>Died of daughter Cysts Jamaican</td>
<td>Cured</td>
</tr>
<tr>
<td>41</td>
<td>M</td>
<td>70</td>
<td>Gold-digger</td>
<td>Liver</td>
<td>Abdominal</td>
<td>Hepatic daughter Cysts</td>
<td>Died from exhaustion</td>
</tr>
<tr>
<td>42</td>
<td>F</td>
<td>20</td>
<td>Dom. But.</td>
<td>Liver</td>
<td>Arterio of Abdominal Section</td>
<td>Cured</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>M</td>
<td>21</td>
<td>Servant</td>
<td>Liver</td>
<td>Aspirated</td>
<td>No sufficient aspirate</td>
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<tr>
<td>44</td>
<td>M</td>
<td>45</td>
<td>Labourer</td>
<td>Liver</td>
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<td>10 ounces gradually disappear</td>
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<tr>
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<td>M</td>
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<td>Dom. But.</td>
<td>Liver</td>
<td>Abdominal Section</td>
<td>Bleed opened</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>M</td>
<td>44</td>
<td>Dom. But.</td>
<td>Liver</td>
<td>Section</td>
<td>Numerous daughter Cysts</td>
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<tr>
<td>47</td>
<td>M</td>
<td>32</td>
<td>Policeman</td>
<td>Liver</td>
<td>Aspirated</td>
<td>30 ounces did not refill</td>
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<td>48</td>
<td>M</td>
<td>49</td>
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<td>Liver</td>
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<td>A few ounces did not refill</td>
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<tr>
<td>49</td>
<td>M</td>
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<td>Dom. But.</td>
<td>Liver</td>
<td>Section</td>
<td>Numerous daughter Cysts</td>
<td>Cured</td>
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<td>50</td>
<td>M</td>
<td>26</td>
<td>Labourer</td>
<td>Liver</td>
<td>Aspirated</td>
<td>9 times re-filled</td>
<td>Cured</td>
</tr>
<tr>
<td>51</td>
<td>M</td>
<td>47</td>
<td>Dom. But.</td>
<td>Liver</td>
<td>Aspirated</td>
<td>4 lbs did not re-fill</td>
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<tr>
<td>52</td>
<td>M</td>
<td>30</td>
<td>Nurse</td>
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<td>53</td>
<td>M</td>
<td>8</td>
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<td>1 pint re-filled once</td>
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<tr>
<td>54</td>
<td>M</td>
<td>9</td>
<td>J. T.</td>
<td>Liver</td>
<td>Aspirated</td>
<td>1 pint re-filled twice</td>
<td>Cured</td>
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<td>Sex</td>
<td>Name and Occupation</td>
<td>Situation</td>
<td>Operation</td>
<td>Remarks</td>
<td>Result</td>
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<td>--------</td>
</tr>
<tr>
<td>55</td>
<td>40</td>
<td>M</td>
<td>M. O.</td>
<td>Hung</td>
<td>not diagnosed during life</td>
<td>Found small, daughter cysts</td>
<td>Died from a tumour on the spine</td>
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<tr>
<td>56</td>
<td>39</td>
<td>M</td>
<td>M. H.</td>
<td>Left hung</td>
<td>Cheated on</td>
<td>Large, more cysts</td>
<td>Complete recovery</td>
</tr>
<tr>
<td>57</td>
<td>40</td>
<td>M</td>
<td>B. S.</td>
<td>Right hung</td>
<td>Aspirated</td>
<td>Complicated with effusion</td>
<td>Complete recovery</td>
</tr>
<tr>
<td>58</td>
<td>39</td>
<td>M</td>
<td>Bow. But.</td>
<td>Right hung</td>
<td>Aspirated</td>
<td>Ruptured, great infection, situated at apex</td>
<td>Died from rupture of haemorrhage</td>
</tr>
<tr>
<td>59</td>
<td>7</td>
<td>M</td>
<td>N. W.</td>
<td>Right hung</td>
<td>Aspirated</td>
<td></td>
<td>Cured</td>
</tr>
<tr>
<td>60</td>
<td>40</td>
<td>M</td>
<td>T. S.</td>
<td>Right hung</td>
<td>Aspirated</td>
<td></td>
<td>Cured</td>
</tr>
<tr>
<td>61</td>
<td>18</td>
<td>M</td>
<td>T. F.</td>
<td>Right pleura aspirated</td>
<td>1 Pint</td>
<td></td>
<td>Cured</td>
</tr>
<tr>
<td>62</td>
<td>29</td>
<td>M</td>
<td>T. B.</td>
<td>Left hung</td>
<td>Chest opened</td>
<td>Cyst wall removed</td>
<td>Died suddenly</td>
</tr>
<tr>
<td>63</td>
<td>30</td>
<td>M</td>
<td>T. D.</td>
<td>Right hung</td>
<td>Aspirated</td>
<td>Muscle removed one cyst</td>
<td>Cured</td>
</tr>
<tr>
<td>64</td>
<td>26</td>
<td>M</td>
<td>T. S.</td>
<td>Spleen aspirated</td>
<td>one pint</td>
<td></td>
<td>Cured</td>
</tr>
<tr>
<td>65</td>
<td>31</td>
<td>M</td>
<td>J. S.</td>
<td>Peritonmem</td>
<td></td>
<td>Severe — intestinal — perforation</td>
<td>Died suddenly from haemorrhage</td>
</tr>
<tr>
<td>66</td>
<td>28</td>
<td>M</td>
<td>J. B.</td>
<td>Kidney aspirated</td>
<td></td>
<td></td>
<td>Cured</td>
</tr>
<tr>
<td>67</td>
<td>6</td>
<td>M</td>
<td>T. H.</td>
<td>Abdominal diapedect out</td>
<td></td>
<td>Muscle removed</td>
<td>Cured</td>
</tr>
<tr>
<td>68</td>
<td>25</td>
<td>M</td>
<td>T. L.</td>
<td>Abdominal diapedect out</td>
<td></td>
<td>Muscle removed</td>
<td>Cured</td>
</tr>
<tr>
<td>69</td>
<td>58</td>
<td>M</td>
<td>W. B.</td>
<td>Pelvis aspirated</td>
<td></td>
<td>Did not re-appear</td>
<td>Cured</td>
</tr>
<tr>
<td>70</td>
<td>7</td>
<td>M</td>
<td>W. N.</td>
<td>Abdominal diapedect out</td>
<td></td>
<td>One of an orange</td>
<td>Cured</td>
</tr>
<tr>
<td>71</td>
<td>30</td>
<td>M</td>
<td>A. T.</td>
<td>Pelvis aspirated</td>
<td></td>
<td>Ruptured, spontaneously passed per rectum</td>
<td>Cured</td>
</tr>
<tr>
<td>72</td>
<td>49</td>
<td>M</td>
<td>T. C.</td>
<td>Muscle of back aspirated</td>
<td>Full of daughter cysts</td>
<td></td>
<td>Cured</td>
</tr>
</tbody>
</table>
## Cases of Hydatids—Treated

<table>
<thead>
<tr>
<th>No.</th>
<th>Sex</th>
<th>Age</th>
<th>Name and Occupation</th>
<th>Situation</th>
<th>Operation</th>
<th>Monocytosis</th>
<th>Monocystic</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>73</td>
<td>M</td>
<td>22</td>
<td>Shipman E.C.</td>
<td>In neck</td>
<td>Biected</td>
<td>10 drops</td>
<td>100%</td>
<td>Cured</td>
</tr>
<tr>
<td>74</td>
<td>M</td>
<td>24</td>
<td>Plumber M.M.</td>
<td>Pelvis</td>
<td>Aspirated</td>
<td>100%</td>
<td>100%</td>
<td>Cured</td>
</tr>
<tr>
<td>75</td>
<td>M</td>
<td>37</td>
<td>Bushman J.G.</td>
<td>Omentum</td>
<td>Aspirated</td>
<td>100%</td>
<td>100%</td>
<td>Cured</td>
</tr>
<tr>
<td>76</td>
<td>F</td>
<td>36</td>
<td>Dom. Daf. T.L.</td>
<td>Abdominal</td>
<td>Biected</td>
<td>100%</td>
<td>100%</td>
<td>Cured</td>
</tr>
<tr>
<td>77</td>
<td>F</td>
<td>22</td>
<td>Dom. Daf. J.B.</td>
<td>Omentum</td>
<td>Aspirated</td>
<td>100%</td>
<td>100%</td>
<td>Relieved</td>
</tr>
<tr>
<td>78</td>
<td>M</td>
<td>40</td>
<td>Laborer J.B.</td>
<td>Omentum</td>
<td>Few drops</td>
<td>Under observation for several months</td>
<td>In status quo</td>
<td></td>
</tr>
</tbody>
</table>
occupied by a hydatid cyst as to cause fatal interference with the passage of blood into the pulmonary artery. Death took place after a sudden attack of dyspnoea and Cardiac oppression.

Peacock and Hicks (St. Thomas Hospital Report 1864) record a case of a lad aged 18 years, where there was a partially collapsed cyst with thickened walls on the surface of the right ventricle of the heart, partially embedded in the muscular structure, but not projecting into the cavity of the ventricle.

In the Australian Medical Journal 1879, p. 394, Sterling and Allen record a case of hydatid in the substance of the right
Ventricle at its apex. It was the size of a hen's egg, and full of daughter cysts.

Thomas (Hydatid of lung p. 12) has collated numerous cases where cysts were found in various branches of the pulmonary artery.

These diagnosis is a matter of great difficulty, and lead usually to the sudden death of the patient.