

Lectures on Tropical Surgery

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fact that safety is

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very different state,

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Temperate Climates. The necessities of the climate require

that the windows shall be open, and that air ^{be} allowed to

enter freely. ~~It is impossible to have the doors on the entrance~~

Operations are conducted with open windows, and it may

be open doors, or under the wave of the Pankah. A concentration

of Chloroform ^{vapor} gas under these circumstances is well-nigh an

impossibility, and the consequence is that an "overdose" of Chlo-

reform is almost unheard of. The apparatus is usually, ^{the} a

^{Sample} ~~Common~~ frame upon which a layer of lint is spread, and ^{by using} ~~with~~ ^{the}

^{the} drop-bottle there is little danger of an overdose.

~~These are the chief reasons for the immunity, spoken of so~~

frequently, in administration of Chloroform in the Tropics,

and their lesson is one that ~~the~~ European and American Anaes-

thetists may well lay to heart.

Every practitioner in the Tropics is aware that the finding of the
Hyderabad Commission is scientifically correct.

8

clear *La Vigne* *(a)* *deal* *for*
ANAEMIA. Europeans. The one physical condition directly attribut-
able to prolonged residence in the tropics, and from which there
is no escape, is a deterior~~ation~~ of the blood and a consequent
an~~emia~~. This state ~~which~~ is the outcome of living in an atmos-
phere of high temperature, and is acceler~~ated~~ by malarial attacks,
leaving heart for sequelae
~~by~~ congested liver, *and* ~~and~~ intestinal or splenic derangements.

The an~~emia~~ may vary between a minor degree and a strongly ~~marked~~
lytic marked ~~anaemia~~, complicated with Hepatic and Splenic enlargement.
When a healthy individual of adult age first visits the tropics
the heat serves as a stimulant, and he can and does enjoy ex-
ercise, which in a few years it is impossible to take without
incurr~~ing~~ lassitude and exhaustion. Many things conduce to this;
the climate in time causes the European in the tropics to yield
to the depressing effects of continued high temperature. The
vitality is lowered; sleep becomes gradually more uncertain and
precarious; appetite is first capricious and then fails, *all these*
tend~~ing~~ to lessened muscular activity and power, *and to increase*
ness of body, and irritability ~~of~~ *of* mind.

The rarefication of air dependent on great heat renders the
amount of Oxygen available in a given quantity of air *less than* ~~less~~ in
temperate climates ~~quantity~~. The blood thereby suffers, the corpuscles diminish *in*
number, and, in consequence, fat accumulates in the tissues of
the body and in the red blood corpuscles themselves. The Con
stant state of perspiration leaves less chance of the kidneys ~~being~~
being well flushed, and the liver becomes engorged with blood.

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It is not ~~always~~ excess of eating and drinking, as is generally supposed, that determines hepatic congestion. The climate ^{it} ~~per se~~ is the initial cause of visceral failing, and renders the European liable to malaria or to any abdominal ailment, such as diarrhoea and dysentery. This habit of body is but little ~~conducive~~ conducive to high recuperative power, and with this condition, the Surgeon has to cope ~~with~~ and to calculate, when any major operation is contemplated. Most Surgeons in the Tropics prefer that Europeans with surgical maladies, ~~who~~ ^{which} do not require immediate treatment, should proceed to more temperate climates before being submitted to operations. This is not caused by any feeling of inferior skill on their part, ~~as is so often stated~~, but ^{by} a conscientious belief ~~on their part~~ ^{insisted upon from the fact} that such a proceeding is for the patients' good. It is ~~that~~ ^{is required} an atmosphere more native, and therefore more health-giving, ~~may be enjoyed~~ than can be met with in the Tropics, be the surroundings ever so sanitary.

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6. Natives. The effect of operations upon Natives ^{is} vary with the class, ~~or~~ ^{status} caste of the patient. It is stated that the majority ~~in fact 9-10%~~ of the native population of most Tropical countries are always on the verge of starvation. This may be true, and yet, except during actual famine, the Native may be fairly well nourished. Nature is more liberal to the Tropical dweller ~~than~~ than to the more northerly resident. The heat of the sun ^{is} ~~is~~ abundantly bestowed that it provides warmth for the body and the household, without the expense of fuel, ^{and} ~~at~~ any but a minimum of raiment. Less actual food is required by the Tropical

than by the European labourer, and the kind of food upon which he thrives is of a relatively cheaper form.

In India caste-prejudices condemn the Hindoo to a farinaceous diet, and ^{most} natives can afford but little else, even should religious rites allow of it. ~~but~~ In illness ^{good} and in times of famine no ~~observant~~ Hindoo would eat flesh, even to save his life. The European surgeon, accustomed to administer beef-tea and strong soups, milk, and stimulants, when recuperative powers flag, must be content to see his patient ~~slowly~~ slipping ~~away~~ through his fingers, without being able to support the strength by ~~x~~ rational methods.

In China a very different state of national feeling exists. ~~The~~ The Chinese have no prohibitions as regards food or drink. It is commonly believed that the Chinese live on rice; ^{but} this is a popular error. The poorest coolie in China, serving a contractor ~~or~~ expects his employer to give him vegetables, and either fish or pork with his two chief meals daily. But the diet for all ~~is~~ that is meagre, and it will be seen

native than by the European labourer, and the kind of food which he thrives in is of a relatively cheaper form. It is however a mistake to think that any native lives, or can live, on rice, as is so frequently ^{widely} ~~said~~ and even ^{serving a contractor} ~~believed~~. The poorest coolie in China expects his employer to give him vegetables and either fish or pork, with his two chief meals daily. ^{But the diet for all that is more agreeable} ~~It will thus be seen~~ that the requisite metabolism of the Tropical Native is less than is the case with dwellers in colder climates, and that the condition thereby induced implies a lower physical resistance. The difference between the Tropical and ^{the} Temperate climate dweller ~~native~~ is best summed up in the word 'stamina'. The ~~sheepish~~ ^{native} resignation of the ~~former~~, when brought up for operation, is not allied to the fortitude of the Stoic ^{or} the courage of the stout-hearted. His spirit ^{goes} ~~is gone~~ and his trembling limbs and quivering muscles reflect his mental state. With a patient in such a condition, it can be easily imagined ^{that} it only wants a supervening shock to bring about ~~the~~ heart-failure; and this is the surgeons chief dread when operating upon Natives. If the native patient can be "got off" the operating-table alive, his chances of recovery are excellent. This is not the case with the average European; his better "stamina" enables him to bear the physical shock of a major operation, but his "Tropical" ~~habits~~ habits, as to mode of living, are less calculated to be beneficial, than are those of the more abstemious native ^{during the stage of Recovery}

Dr. V. M. C. C.

Jones

20

The OPIUM-HABIT as it affects Surgery. Opium is largely ~~consumed~~ ^{consumed} in China ^(the Malay Peninsula) to allay pain. Smoking is the usual method of ingestion, ^{but} and with the ^{custom} ~~habit~~ once induced, it is prone to lay hold on the individual and to be continued as a habit when the reasons for its first being used have gone. Opium is extensively smoked by phthisical people, and so prevalent is phthisis ~~in China~~ amongst opium-smokers, that no operation should be undertaken without first ascertaining the condition of the lungs. So effectually may the opium mask the attendant cough, ~~that~~ that it is only by physical signs ^{but} the condition is to be diagnosed. The opium-habit in phthisis does ^{not} ~~not~~ ^{however}, ^{her ee} diminish ~~the~~ the chances of recovery, as compared with non-smoking phthisical people; in fact, most medical men are agreed that ^(the Subjects of phthisis who smoke opium) if anything, ^{live} ~~live~~ longer than their more abstemious countrymen.

Opium is also largely smoked by patients suffering from Stone in the bladder. It is ^{by them} ~~here~~ taken ^{also} to allay pain and irritation. No Surgeon would hesitate, however, to operate upon a man for stone because he was an opium-smoker. Recovery is as probable with the opium consumer as with the non-consumer.

The writer My ~~own~~ observations have led ^(Quin) ~~to~~ ^{the} conclusion that ~~on the face of it seems to show no real reason, namely that opium~~ smokers suffering from Calculus, seem to do better after Lithotomy than after Lithotrity, and this too when no discoverable ^{Visceral disease} ~~kidney trouble~~ ^{was found} is to be made out.

As regards opium-smoking, it may be safely summarized thus: no surgeon need hesitate operating upon an opium-smoker because

of the habit. In other words, an opium-smoker with sound viscera has as good a chance of recovery as those who ^{he} do ^{as} not indulge in the ^{practice} ~~habit~~. The smoker ought not to be deprived of his solace after the operation is over. To submit a patient to the doubled strain of a surgical operation and to the nervous irritability induced, owing to suddenly stopping ^{his opium} ~~the habit~~, is not a wise ~~the~~ thing to do. It is ^{mostly} ~~only~~ after severe operations on the lips, jaws, tongue, or trachea, that smoking becomes an impossibility, and to opium-smokers so afflicted, ^m morphia ought to be administered hypodermically, with no stinted hand. In head-injuries with insensibility, deprivation of opium is not likely to prove detrimental, as the inhalation of the drug is more of a habit and a mental solace than a physical necessity.

dur.

Diabetes. This disease is very prevalent amongst the better classes of Asiatics. The persons most affected are those of them who take to "European" food and drink, as it is this class of Native that comes to the "foreign doctor" most frequently, it behoves ^{the Surgeon} ~~one~~ before performing any operation, however slight, to assure himself ^{the importance of} ~~on this point~~ ^{as regards diabetes.}. It is well known that Jews in this and in other countries are very liable to diabetes; and as I have just remarked, that the disease is found amongst the more Europeanized Natives of Tropical countries, in much larger proportion than amongst those living on the diet to which they are ^{accustomed} ~~to the manner born~~, so it may be, that in this fact, we have a ^{physical reminder} ~~the fact~~ that the Jews are ~~an~~ Oriental people, and that their metabolic powers have not, even after all these years, adapted ^{completely} themselves to European food and drink.

(over)

Intestinal Worms. Dwellers in the tropics are so commonly

the hosts of intestinal parasites, that it ^{is} well to pay attention to this subject before ^{proceeding with any operation:} ~~any~~ ^{more than once} ~~operation is proceeded with.~~

The writer has had cause to regret this omission, more than ^{in the following case} ~~once~~, and never more so than ^{patient} ~~after an ovariectomy.~~ The ~~case~~

was that of a Chinawoman, upon whom Ovariectomy ^{had been} ~~was~~ performed.

^{progressed normally} ^{fourth} all went well until the ~~fifth~~ day, when, without any rise of ~~the~~

temperature or other untoward symptom, vomiting commenced,

and proved uncontrollable. On ~~the~~ The seventh day the patient became completely exhausted, and an hour before death, vomited a male ~~female~~ ^{male} ~~female~~ ^{male} worm, measuring 5 inches & 8 inches respectively.

When natives take to what they call "European" food, they indulge themselves to an extent ^{that} which is calculated to upset their ~~==~~ economy. The "European" food is usually taken in addition to ~~==~~ their own form of diet, whatever that may be, and all that is ~~e~~ rich and highly nitrogenous in Western food is selected. Wines ~~E~~ also, especially sparkling wines, ^{are} ~~is~~ regarded as an essential ~~part~~ of the menu, and champagne, ^{sweetened to} ~~suit~~ ~~the~~ Oriental palates, is freely imbibed. Gout, albuminuria, and diabetes are the necessary sequelae of such a regime, and for surgical purposes the well-to-do native, who "Europeanizes" his diet, is perhaps the worst ~~E~~ kind of ^{Surgical subject coming} ~~patients met~~ with in tropical practice. The excess of starchy materials ~~ingested~~ by natives during their ordinary meals ^{that} may be in accordance with climatic wants; but with a diet which bulks largely in rice, the accession of meat and sweet champagne, as extras, prove impossible to metabolize.

LOW INTESTINAL WORMS. Dwellers in the tropics are so ^{commonly} ~~commonly~~ the
hosts of intestinal parasites, that it is well to pay attention to
this subject, before ^{proceeding with} any operation of expediency, is ~~proceeded with~~.
The writer has had cause to regret the omission ^{on} ~~fore~~ than once; but
never more pronouncedly than in the following case. The patient, a
Chinawoman, had ^{an ovarian tumour removed} ~~ovariotomy performed upon her~~; all went well un-
til the fourth day, when, without any rise of temperature, or other
untoward symptom, vomiting commenced and proved uncontrollable. On the
seventh day the patient became completely exhausted, and an hour ^{before}
death vomited a male and female round worm, measuring 5, and 8, inches
respectively.

In "preparing" a patient for operation, be it a native or European
^{the surgeon} ~~this~~ ^{possibility} ~~fact~~ should never be ^{lost} ~~lost~~ sight of. The ^{this possibility} ~~round worm~~ is so
common an inhabitant of the intestine in ^h ~~troical~~ countries, ~~that~~
that it ought to be regarded as a possible constant. Even if no
previous ^m ~~syptoms~~ suggest the presence of worms, it is well not
to rely on the history, but to administer. santonin, or other
anthelmintic, as occasion requires, a few days before undertaking
operations of expediency. With the altered regime entailed after
an operation, such as rest in bed, alteration in diet, etc, the
parasite, previously passive, may set up a train of symptoms,
such as ^{vomiting,} ~~colic~~, diarrhoea, mucous and bloody stools, which are
anything but conducive to the healing of wounds, or the rest
^{that} ~~which~~ may be ^{necessary} ~~compulsory~~ to satisfactory progress.

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Jones

MALARIA. All residents in the tropics are under the ban of malarial infection. In health the apparent immunity of some dwellers is proverbial; but when any untoward condition arises, reducing the powers of resistance of the patient, 'fever' is ^{always} ~~well-nigh~~ certain to show itself. European sojourners in the tropics may never develop fever until they return to the cold and damp of a temperate climate. A healthy woman, who never had an attack of fever, is ^{liable} ~~apt~~ to develop it after parturition; the soldier who has escaped the disease in an India barracks, almost invariably develops fever when wounded in action. Occasions might be multiplied to show that ^{"all"} tropical residents ~~all~~ ^{have} fever in them"; and that when the vitality is lowered, either by climate or accident, the symptoms of its presence show themselves. In like manner surgical operations are ^{liable} ~~apt~~ to be followed by the evidences of malarial infection. Whatever lowers the vitality, be it such illnesses, ^{Typhoid or} as influenza; accidents, such as gun-shot injuries, ^{or} ^c fractures; surgical operations, of a more or less severe nature, may 'let loose' the poison.

With the threat of malarial fever impending after all surgical interference, the possibility of its development has to be considered and taken into account whilst a prognosis is being given or an operation contemplated. The previous history of the patient as regards "fever" has to be enquired into; the viscera have to ^{be} examined to ascertain whether ^{or not} they are affected by malaria; ~~or not~~; and, it is a necessary step, to search ^{for}

for the plasmodium malaria in the blood. Within the ^{ae} last few years ^{The} last-mentioned enquiry has ^{very nearly} well-nigh attained the position of an exact science.

The mystery attaching to malarial infection is rapidly disappearing, and the development of fever at such ^{un} seemingly untimely and unlooked-for occasions, as during the return to cooler climates, is in a fair way to be solved. Nature provides means of resisting disease, and of eliminating septic and infective material in the case of many exposures in the category # of possible ailments, and she has not neglected to do so in case of malaria. In health, the phagocytes, the scavengers of the blood, maintain the balance in favour of the individual; but if for any reason their activity or power of work is in abeyance, the adventitious increment may obtain the upper hand. With active phagocytes, a moderate degree of infection may be defied, but should the blood become deluged with poison, it can be easily imagined that their power may prove insufficient. On the other hand, should their power of 'purifying' the blood be withheld, the same result may obtain. Perhaps we are ^{likely} apt to assign more to the phagocyte than its action would justify, but it ^{is} certain, by exact microscopic proof, that ~~their~~ ^{its} power of attacking the plasmodium malaria, ^{at} in the red corpuscles of the blood, is considerable. There may be other potent factors at work, towards the same salutary end, but their

power ^{has} ~~has~~ not received scientific proof. The writer ^{has} ~~has~~ demonstrated ^{marked} ~~marked~~ between the presence the connection and absence of phagocytes, in freedom from, and attacks of, fever, respectively. On more than one occasion,

The most convincing elucidation of this phenomenon was in the case of a Japanese servant of the writer's. Whilst investigating the subject of the plasmodium, the blood of this man was frequently examined ^{for} ~~over~~ a period of several months. Whilst the man was in health, phagocytes were numerous and active; but, when his first attack of fever developed, the phagocytes almost completely, if not wholly, disappeared. As the fever subsided they ~~re~~ again appeared, and with the restoration to health they were ^{numerous} ~~as~~ active ^{as} before. This single case is sufficient to show the relation of the phagocyte to the plasmodium malariae and ~~the~~ the so-called immunity from, or liability to contract, fever. This is not the place to discuss more fully the great and important subject of malarial disease, nor to dwell upon the excellent work being done in this country by Manson, in India by Ross, in America by Osler and MacCullum, and in Italy but a number of patient and honest observers. It is sufficient to acknowledge the fact, and to insist upon the absolute necessity, of every resident tropical practitioner acquiring an intimate knowledge of the writings of these men, and of employing the microscopic test in all fevers occurring in Malarial countries.

Within the last few months a great and important fact has
 been well-nigh proved, which will have a pronounced practical bearing. Ross, in Calcutta, has demonstrated that ~~not only~~
 when the mosquito bite^{not only} does it imbibe the blood and the
 parasite into its stomach, but here the parasite undergoes
 development into a subsequent phase of its existence. Farther,
 that the pigmented body characteristic of the malarial parasite becomes embedded in the tissues of the mosquito itself. But
 more important than all, ^{Ross} ~~he~~ has proved, in birds at all events,
 that the bite of mosquitos charged with the malarial parasite
 can convey infection to healthy birds. This is perhaps one of
 the most important discoveries of the century, for it implies
 that Malaria can be 'caught' by the mosquito's bite. The practical
 bearing of this is at once apparent, and protection from mos-
 quitos will become a greater factor in the daily life of Tropical residents, than even it has been formerly. Mosquitos
 have been dreaded on account of the local cutaneous affections
 they caused, but when it is appreciated that they, in addition,
 convey a deadly poison ^{with their} ~~when they bite~~, their presence ~~will~~ assumes a real danger.

TREATMENT. The treatment of malaria may be summed up in the ~~one~~ ^{one} word quinine. Quinine may be employed as a prophylactic or as a curative agent, but no other drug can be named ^{not} along ^{will serve, in effectiveness, the} side of this well-established remedy. The writer exhibited quinine in tropical practice after parturition with marked benefit; ^{after} before surgical operations, whether the patient gave a history of ague or no. In fact, quinine is the only means we can ^{rely upon} look to to avert or control the fevers of the tropics, let them arise spontaneously or after the surgeon has reduced the powers of resistance of the patient, by surgical treatment.

Leprosy, Surgical operations can be undertaken upon the Leper with good hopes of success. In the later stages, of course one is but seldom called upon to perform any operation, but skin wounds heal rapidly. The operations I have done are excision of nerves in the neck, subcutaneous division of contracted tendons in the hand, and subcutaneous division of palmar fascia. The parts healed without trouble; in fact it was remarkable how speedily they closed. A ragged stump which caused great inconvenience to a leper, induced me to perform a modified Hey's amputation of the foot. The parts healed very rapidly.

Beri-beri. Patients in the acute stages of the moist variety of Beri-beri, do very badly, if any surgical operation, however slight, is necessary.

Charles
The Tropical
Surgery in Warm & Temperate Climates Compared

The results of surgical operations in the tropics as compared with those met with in temperate climates, will be best shown by a comparative statement in the form of a tabulated schedule. It will be seen that ^{during the fifties} the death-rate, ^{during the sixties} in the Medical College Hospital, Calcutta is slightly higher than the mortality in London Hospitals at about the same period. Whilst, however, studying these results, it must be remembered that:-

1. The patients in Calcutta were native Indians.
2. The normal death-rate of Calcutta is double the normal death-rate of London.
3. Calcutta is perhaps situated more disadvantageously than any other town in the tropics:-
 - a. Over-crowding is rife.
 - b. Good drainage is well-nigh impossible, owing to the city being being waterlogged, in consequence of its situation on low-lying ground.
 - c. The natives are amongst the poorest and dirtiest of the inhabitants of India.
4. Hospitals, ^{the sixties} in former times, were old-fashioned; European nurses were ^{almost} well-nigh unknown; native assistants had the handling of wounds and dressings.
5. A great deal of the surgery on natives is desperate surgery; the surgeon is called upon to act when disease has gained a firm hold of the patient, or ¹¹⁵ when it is well nigh useless to save life or effect a cure. The difference, therefore, in results, might be expected to be greater than ^{we} really find it.

The effect of modern surgical methods are well illustrated

when Lt.-Col. MacLeod's results are noted. But in addition to the introduction of Listerism, many Hospitals in Calcutta have been rebuilt and remodelled; the European method of nursing has been followed; and the general sanitation of the city has been improved, thus accounting in India, as it has in Britain and America for increasingly good results. ~~Pre-Sanitary and pre-Listerian~~ ^{epochs} ~~dates~~ are ^{nearly} well-nigh contemporaneous, and it is only since ~~the ushering in of~~

LC the Listerian period that the insanitary state of Hospitals has been dealt with. In fact, before the introduction of cleanliness, the balance was perhaps in favour of the tropical, rather than of the Hospitals in Temperate Climates. The Hospitals in the Tropics, uncommon with all dwellings, are much more open to the air than in more northern latitudes. The exigencies of the climate rendered the free circulation of air a necessity, where-
(as up to two or three decades ago, fresh air was rigidly excluded from European Hospitals, and more especially in cases of illness, from dwelling-houses also. The writer saw in a London Hospital, during the ^{early} 'Seventies', whilst yet Listerism was unpractised, thirteen out of seventeen cases of major operations die in one ward - "the ~~operation~~ ^{operation} ward", of Pyaemia, septicaemia, or phlegmonous erysipelas.

This is as terrible a record as can be found in any Hospital in Calcutta during pre-Listerian days. Sir Joseph Fayrer Bart. in his "Clinical Surgery in India", gives a faithful account of the results of operations performed by him in the Medical College Hospital, Calcutta, and although the death rate is high, it is ^{markedly} ~~not~~ higher than the mortality in the Hospitals of London and Paris during the same periods. With these few preliminary considerations, the conditions which affect surgical operations in the tropics will be dealt with ~~seriatim~~. In mentioning and referring to Calcutta the writer does so ~~frequently~~ inasmuch as Calcutta must be regarded as a

oriental
a typical city; that in Calcutta surgical practice ^{is} to be met with on an extensive scale; that some excellent surgeons such as Sir Joseph Fayrer Bart, and Lt. Col. Kenneth Macleod ^{that} have placed careful records at our disposal, and as a seat of medical education in India it enjoys not only well-regulated Hospitals, but Hospitals which have been under European control for many years. In many other parts of the Tropics excellent surgical work has been, and is being done, but nowhere except perhaps in Bombay, is there anything approximating the wealth of material for study.

Comparative statements of the mortality after amputations in Hospitals in Temperate and Tropical Climates.

	Cases	Deaths	Mortality ^{per cent}	Recorder.
Crimean War (1854-1855)	1641	688	41.31	MacLeod.
French Army 1854-1860	5037	3210	63.52	Legouest.
Calcutta 1859-1870	227	102	45.13	Fayrer.
newcastle-on-Tyne 1870-74 Guys Hospital 1861-78	864	305	35.37	Bryant.
Calcutta 1879-1883	61	16	26.22	Kenneth MacLeod.
Calcutta 1886-1890	99	17	7.1	MacLeod.
newcastle-on-Tyne 1878-88			6.7	F. Page

Pyæmia as a cause of death.—

Of the 305 deaths recorded by Bryant, 82 (26.88%) died of *Pyæmia*.
Pyæmia.

Of the 102 deaths recorded by Fayrer, 68 (66.66%) died of *Pyæmia*.
Pyæmia.

From the above statements it would appear that the results of surgical operations in pre-Listerian days in Calcutta were pretty much in line with the results obtained in other countries.

In the Calcutta Hospital from 1879-85 modified antiseptics were in force, and from 1886-90 a strict antiseptic regime was followed.

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As a specimen of surgical work in an Indian Hospital, a
list of 1848 operations performed in the Medical College
Hospital, Calcutta, by Surg^l Col. Kenneth MacLeod, Professor of
Surgery, Netley, is here appended.

91

1848 operations performed by N. C. Macleod in the Medical College Hospital, Calcutta during the years 1879-1883, and 1886-1890.

Years	Modified and repeated 1879-1883			First and repeated 1886-1890			Total of 10 years		
Description of operation	N ^o	D	%	N ^o	D	%	N ^o	D	%
I. Eye operations: ⁽¹⁾	5	0	-	2	0	-	7	0	-
II. Operations on arteries:	5	0	-	6	0	-	11	0	-
III. Operations on veins:	"	"	-	15	0	-	15	0	-
IV. Operations on joints:									
Excisions:	9	2	22.2	17	1	5.9	26	3	11.5
Others:	32	2	6.2	51	0	-	73	2	2.8
Total joint operations:	41	4	9.8	68	1	1.5	109	5	4.6
V. Operations on bones:	26	0	-	90	5	5.5	116	5	4.3
A. Amputations: ⁽²⁾									
1. Primary:	11	3	27.3	21	1	4.8	32	4	12.5
2. Secondary:	14	5	35.7	14	4	28.6	28	9	32.1
B. for disease: ⁽³⁾	22	7	31.8	41	2	4.9	63	9	14.3
Total amputations (including fingers & toes):	61	16	26.2	99	7	7.1	160	23	14.4
VII. Removal of tumours: ⁽⁴⁾									
A. Malignant:	49	13	26.5	87	9	10.3	136	22	16.2
B. Non-malignant: Elephantiasis:	140	26	18.6	117	4	3.4	257	30	11.7
2 Others:	65	9	13.8	129	4	3.1	194	13	6.7
Total tumours:	254	48	18.9	333	17	5.1	587	65	11.1
VIII. Removal of foreign bodies:	7	0	-	4	0	-	11	0	-
IX. Removal of calculi: ⁽⁵⁾									
A. Urthelial:	3	0	-	3	0	-	6	0	-
B. Vesical:									
1. by cutting:	19	3	15.8	12	0	-	31	3	9.7
2. by crushing:	8	1	12.5	25	3	12.0	33	4	12.1
Total calculi:	30	4	13.3	40	3	7.5	70	7	10.0
X. Incisions:									
Tracheotomy:	17	7	41.2	13	5	38.5	30	12	40.0
Herniotomy:	18	9	50.0	29	13	44.8	47	18	46.8
For Radical cure of Hernia: ⁽³⁾	46	3	6.5	61	7	11.5	107	10	9.4
Laparotomy:	1	1	100.0	4	4	100.0	5	5	100.0
Urethrotomy:	29	5	17.2	70	16	22.8	99	21	21.2
Others:	178	17	9.6	151	7	4.6	329	24	7.3
Total incisions:	289	42	14.5	329	52	15.8	618	94	15.2
XI. Reparative operations:	61	3	4.9	36	0	-	97	3	3.1
XII. Operations not classed:	21	1	4.8	26	0	-	47	1	2.1
Grand Total:	800	118	14.7	1048	85	8.1	1848	204	11.0

(1) There is a separate Eye Hospital connected with the M. C. Hospital.

(2) Admitted mostly in a septic condition.

* Excluding fingers and toes.

(3) A great deal of this work tentative.

FILARIASIS. *See Hamilton art? 8/11 Carlos*

sol
By ~~Filariasis~~ is meant an infection of the human body by a species of nematoid which on account of its filiform appearance, is termed -- Filaria .

In the year 1870, Lewis, of Calcutta, found a peculiar microscopic^{ad} worm in the chylous ~~urine~~ urine of a patient suffering from elephantoid fever; and in 1872 the same observer found a similar parasite in the human blood. Ever since, the association of this parasitic worm with elephantiasis has fascinated scientific investigators, and the result is an established theory in regard to their connection.

sol
The parasite was named the filaria sanguinis hominis, as, when first found, it was believed to be the only filaria infesting the human blood; but recently the name has been still further specified, in consequence of the investigations of ^{Manson} Dr. Patrick Manson who has added considerably to our knowledge of the parasite in many ways.

Sanitarius
The three best known are:—

- repeat*
- | | | | | | |
|------|---------|-----------|---------|----------------------|-----------------|
| 11/0 | Filaria | Sanguinis | Hominis | Diurna | <i>Nocturna</i> |
| 12/0 | " | " | " | Nocturna | <i>Piurna</i> |
| 13/0 | " | " | " | Perstans. | |

Besides these well known forms, Manson has drawn attention to three more blood-worms which have been named:—

- repeat*
- | | | |
|------|---------|------------|
| 14/0 | Filaria | Demarquaii |
| 15/0 | " | Ozzardi |
| 16/0 | " | Magalhães. |

The terms diurna, nocturna, and perstans refer to the habits of the parasite, the diurna being so named from the fact that it is to be found in the blood (only during the day); the nocturna variety is ^{found} met with in the blood (only during the night), between the hours of 5 to 6 p.m., and 6 to 8 A.M.; whilst the perstans, Demarquaii, and Ozzardi are to be found in the blood at ^{all} any hour of the ~~night~~ ^{and} or day.

The pathological significance of none of these worms is of immediate importance to the Surgeon, except ^{in the} the variety Nocturna. With this worm is associated what is known as elephantiasis and its sequelae, and it is with this expression of filariasis with which surgery has directly to do. However interesting to the helminthologist the co-related worms are, space will not allow of their discussion here.

Nocturna -

The Filaria Sanguinis hominis. To obtain a specimen of this blood-worm, it is ^{sufficient} ~~necessary~~ to draw the blood from the infected person after, say 9 p.m. This ^{is as described in Vol. 11 Chapter 2} ~~readily done by pricking the finger tip by a needle, placing a drop of the blood on a microscopic slide, superimposing a cover glass and examining the specimen by a 1/2 inch or 1 inch power. A rapid survey of the field may bring into view one, or several of rapidly moving worm-like bodies, which by their activity attract attention readily.~~ If the specimen is ringed with vaseline, the activity of the filaria may be ^{watched} ~~excited~~ for hours, or even days. As seen ^{as a} by a low power, the filaria appears ^{as a} colourless, and transparent worm, rather blunt at one end, but tapering to the other. When examined more in detail and by a higher power, say 1/6 th, the animal is seen to possess a sheath, in which it lives and moves. ~~The sheath~~

Birmingham

After a few hours the rapidity of the movements lessens, when the anatomy of the worm can be more carefully investigated. ¹¹⁶ ^{LC} tion will suffice. ~~In the words of Lewis:~~ "Its average length is ^{1-75th} of an inch, its average breadth ^{1-3500th} of an inch, or about equal to the diameter of a red blood-corpuscle. It is enclosed in a transparent tubular sac, within which it can be seen to alternately contract and elongate itself. This sac is extremely delicate and translucent, and may sometimes, when the worm has shortened itself more than usual, be seen collapsed and folded like a ribbon, and the next moment be instantaneously straightened again by the extension of the filaria to its ordinary length. After death the worm may occupy either the entire length of the tubular sac, or be so concentrated as to leave the tube empty at one or both ends." (Lewis)

A

The worm itself, according to Manson, consists of a column of closely packed cells, enclosed in a transversely striated cylinder; and shows, from before backwards, a head with a six-lipped aperture from which occasionally a short fang of great delicacy protrudes and retracts. ⁽⁶⁾ About 1-5th of the way along the body a shining patch, which ^{Manson has named the V-patch, is to be} ~~is to be seen~~ is to be seen. A little behind the middle of the animal, along its axis, a granular material, possibly a special organ, is to be made out, and between this body and the tail, a second bright spot is evident, somewhat resembling the anterior. The function of these specialized parts is not known, but it is presumed that reproduction is their primary object.

sheath is considerably longer than the body, and the animal in its
movements shoots backwards and forwards within ^{it} ~~the sheath~~ with great
rapidity for the first few hours, but afterwards
it slows down & the anatomy of the worm can

sect fed, develops and becomes metamorphosed so as to be capable of separate existence. When the mosquito dies, the parasite worm escapes, and gaining access to the ~~wa~~ food, or more likely the drinking water, is ~~imbedded~~ ^{carried} into the human stomach and again starts on its cycle of life. *In view of Ross's observations in connection with malaria, it may be the bite of the mosquito infects man.*

It has been shown, chiefly by Manson, that the presence of filaria in the blood is not necessarily followed by any sign, ~~or~~ symptom, or pathological change; ~~that~~ in fact, in several parts of the world filaria infest the blood of a large portion of ~~the~~ the inhabitants without causing, in the majority of instances, any evident disturbance. This being the case, how comes it that ~~the~~ the worm sets up disease *in some instances only?*

LC
Jones
(?)
The filaria is a viviparous animal; that is, the ova to be seen stocking its body, do not escape as ova, but as ~~as~~ mobile worms of the character described above. But if these worms are non-obstructive to the lymph-channels, ^{what is the explanation of} ~~how comes it that~~ the train of symptoms ^{that arise,} ~~which~~ commencing with lymphatic obstruction, ~~and~~ dilatation, gland enlargement, ^{subsequent} ~~leading on to~~ elephantiasis, ^{comes about?}

The explanation is, that for some reason, traumatic it may be, the parent worm aborts or delivers the ova into the ^m lymphatic ~~&~~ channels whilst they are still ova, and before they have attained the thread-like form in which they are normally born.

It is evident that ova of the size specified would obstruct the lymphatics of the human body. The ova expelled in a lump, as it were, just before breaking from their fetal coverings

living as a free independent organism in water when the mosqui
to dies after depositing her ova.

This worm is only the immature young of parent parasites¹⁴⁰ named, after the discoverer (Bancroft), *Filaria Bancrofti*. The parents are much larger than the progeny, the female being in length, some ^{3 1/2} three and a half inches, and in breadth ^{7/80} one-seventieth of an inch. The male worm is much narrower, being only ^{1/80} 1-180th of an inch in diameter. The discovery of the female led to an acquaintance ^{with} of the sexual apparatus, and the means of reproduction. In the uterus of the female, ova measuring ^{1/666} 1-666th of an inch by ^{1/740} 1-740th of an inch ^{are seen} were seen; and they can be detected in utero from almost their earliest conception to their more completed forms. The parent-forms have their habitat in the lymphatics, and as the ^{Embryos} ova escape they get into the lymph-channels, and ~~whereupon~~ ~~are~~ are carried onwards through the glands and thoracic duct to the blood.

It is the immature worm, thus developed, that we find in the blood; but, being immature, how can the parasite provide for its continuance? The gap in the life-history was supplied by Dr. Manson. He believed and proved that the mosquito was the intermediary host in which the immature worm was developed. By long-continued observation and experiment, he found that the visits of the mosquito ^{to the human beings} fulfilled other ends than merely supplying food to this insect; that, in fact, in the stomach and tissues of the mosquito, the immature filaria, sucked in with the blood as the in-

within the vaginal passage, are at their largest size, and, getting into the lymphatics, they act as emboli, ~~and~~ blocking the lymph channels, the glands, or even the thoracic duct, ^{cause a} distension of all lymphatic tracts ^{distal to or} beyond them.

Clear symptoms of filarial disease. - according to the group of lymphatics obstructed, so do we find variations of the evidence of the disease.

Should the obstruction occur in the extremities, the foot or hand will ~~become the sports of the extremity beyond~~ will ^{in time} become in time elephantoid; should, on the other hand, the inguinal ~~glands~~ glands be the seat of trouble, what is called "varicose groin glands," ^{or} ~~will result, or~~ lymphoscrotum, will result; when the channels around the bladder or kidney become impassable to the immature ova, chyluria supervenes; or should the thoracic duct itself be blocked, then the whole area of lymphatics below may become varicose.

With the general statement of filariasis ^{as} given above, the details of the ^{sequelae} condition will be readily understood.

See V. ABSCCESS. Should a parent filaria die, as it lies in the lymphatics of a limb, its remains may be absorbed, or, on the other ~~hand~~ hand, its presence may cause irritation and inflammation ^{which} ~~result~~ ^{resulting, perhaps, in an} abscess, may ~~result~~. At times these burst spontaneously; but if the surgeon should incise ^{them} ~~it~~ ^{parent} a filarial ~~worm~~ may be found. ~~The worm~~ would, no doubt, be more often found than it is, were the surgeon alive to the possibility. Dr Manson has drawn

attention to the probability of internal abscesses forming in the thorax and abdomen. The writer, on examining the pus drawn from an abscess situated at the back of the liver/ (between the layers of the broad ligament), found what seemed to be the sheaths of filarial parasites. in the specimen. At the time the writer was fully convinced that they were filarial sheaths, ~~he saw~~ ^{then} but, being ^{unacquainted} ~~at the time~~ with the possibility of their being ~~actually~~ ^{he} filarial, did not publish the statement.

VARICOSE INGUINAL GLANDS. ^{Palatitudes} In ~~regions~~ ^{where} the filarial worm is prevalent, one not infrequently meets with peculiar, soft, painless enlargements in one or both groins. The swellings may attain a large size, without causing the patient ~~any~~ ^{but little} suffering or discomfort; and it is only when an attack of adenitis occurs that the condition is brought under the notice of the Surgeon. Unless ^{it} ~~the~~ ^{that} possibility of the swelling being ^{very possibly be} filarial, ~~happens to~~ occurs to the surgeon, ^{im} it is probable that a correct diagnosis will be made. ^{se} There are many evident causes ~~which~~ ^{that} suggest themselves to account for the adenitis, such as penile or anal irritation, which can be readily eliminated, ^{on some occasions} and so forth, but the writer fell ~~into still more grievous error~~ ^{as case of filarial inguinal adenitis has been mistaken for plague,} ~~During the plague epidemic~~ ^{the diagnosis being finally established by chyluria and finding the parasite in the blood} in Hongkong, in 1894, the writer saw a patient with high fever, slight incoherence, foul tongue, severe headache and large swollen glands in the left groin. The patient was a Parsee and ^{from} ~~the fact that~~ a fellow resident had been taken out of the same house, the pre-

vious day, suffering from Plague, ^{it} ~~he~~ naturally suggested it-
 self that this also was a case of plague, and the patient ^{was} ~~for~~
 with conveyed to the plague Hospital. In 24 hours the pain
 and fever had subsided, a copious discharge of chylous urine
 pronounced the diagnosis which was still further corroborated &
 by filaria being found in the blood. It is satisfactory to know
 that although the patient was exposed to the infection of plag-
 ue he did not contract the disease.

LYMPH-SCROTUM. Associated with varicose lymphatic trunks in the
 groin and thigh ^{is the enlargement of} ~~the~~ ^{the dilatation of} the scrotum ~~becomes enlarged~~ and the lymphatic
~~trunks~~ upon ~~the~~ ^{its} surface, are seen to be dilated. At first the ~~the~~
 skin is soft and smooth and doughy, but as development proceeds,
 the parts become denser and rougher with each succeeding in-
 flammatory increment. ^{the prepuce} ~~the~~ ^{penile covering generally are} likewise affected,
 and the parts may in course of time grow to truly elephan-
 tine dimensions.

HYDROCELE. It is seldom that a lymph-scrotum attains any size
 before ^{the development of} a hydrocele with contents possessing the milky appear-
 ance of chyliferous fluid, ~~developes~~ ^{develops}. But a true lymphoid hydro-
 cele may develop ^{independently} of the superficial scrotal
 tissues ^{being} ~~of the nature of lymph scrotum~~ ^{involved}. The writer on
 one occasion proceeded to tap a hydrocele of the testicle, not
 in the least ~~expecting~~ ^{expecting} to meet with other than the clear
 fluid of an ordinary hydrocele. There were no collateral signs

4

anywhere to indicate that the fluid might prove chyliferous. &
Such however it proved to be, and the presence of filaria in
the fluid and in the blood clinched the diagnosis.

De 8.
CHYLURIA. With or without previous warning, the urine of a
person living in a region where infection by filaria is ~~possible~~,
~~is observed to be~~ ^{noticed} that the urine is milky in appearance. Not the
mere milkiness of phosphates, but the urine seems quite creamy,
and its flow is at times interfered with, owing to the clotting
of the material. Should any previous symptoms obtain, they will
be those of feverishness, backache, dragging pains in the loins
and groins, and symptoms as if a renal calculus was passing.

LC
The urine, known as "chylous," coagulates soon after passing, and
speedily arranges itself into a fluid and ^a solid part. The super
solid part consists of a stringy, fibrinous coagulum, of a
white or pink colour, forming the main bulk of the discharge.
Beneath this material the urinary salts ^{deposit,} ~~collect~~, and on the
top, and surrounding the coagulum, the fluid has a creamy appear-
ance. The coagulum and ^e ~~deposit~~ ^{consist of} intermingled epithelium, a
few red and white blood-corpuscles, ^{with} and a large element of
a fatty ^{material} ~~nature~~ pervades ^{ing} the whole. In the several parts of the
fluid and coagulum, filaria can usually be found by the mic-
roscope. ~~an~~ albuminous precipitate is obtained by boiling.

Ch Vm
ELEPHANTOID FEVER. Accompanying all filarial diseases, fever
sooner or later manifests itself. The attack is of a specific
~~character and~~ has been named by Sir Joseph Fayrer "elephantoid

fever". We are not aware that it occurs independently of local manifestations of an inflammatory nature, and it ^{is} these disturbances that specialize the attack. Lymphangitis, ~~and~~ ^{and} adenitis are invariable concomitants; and the result of the attack is associated with an increased area of tissue being *implicated* and added to the diseased part. The lymphoscrotum is increased in bulk, the extremity is ^{further} thickened, or the mass of the inguinal glands attains a larger size. The signs are those of lymphangitis and adenitis arising from other causes; there ~~is~~ ^{is} local pain, swelling, and redness. The lymphatics may be mapped out as red streaks extending up the limb; or, if the attack is concentrated in the lumbar and abdominal glands, severe backache and testicular neuralgia are pronounced. In addition to the more common symptoms of "fever", vomiting and delirium are ^{fairly} ~~more~~ ^{constant} ~~frequent~~. The onset is usually very sudden, the patient being struck down with severe rigors, generally of a prolonged nature. The high temperature may last for a few hours or a few days, and passes off with profuse sweating. Chyluria is evidence of the pelvic or abdominal lymphatics being implicated, and *is* a further aid in the diagnosis of the disease.

See, Dr. Vines
TREATMENT OF FILARIAL DISEASES. Little ^{is} ~~is~~ said in regard to the treatment of this insidious disease, whether as regards prophylaxis or remedial agents. Given a case in which filaria is found in the blood, we know of no drug that can reach the parasite, and thereby cure the disease.

Where removal to a non-filarial district is possible, the treatment ^{ought} to be tried at once. In the case of Europeans this is

~~feasible usually~~, but the native cannot, or will not, submit to any such regime. Short of removal, nothing can be done except

to treat symptoms as they arise. However, ~~it~~ it is consoling to know that the disease may spontaneously subside. The parent ^{filaria} ~~worm~~

may die, and with the disappearance of the worm from the blood, the extension of the disease ~~will~~ ^{cease}, although ~~the~~

the thickened tissues may remain. Of the many drugs recommended specific action has been claimed for several, but neither in the

^{practice} hands of the writer, nor in ^{that of} those with more extensive experience of such treatment, has success been attained. Methylene

blue has only newness to recommend it, but it would seem as inefficacious as its forerunners, which included gallic acid,

iron, quinine, ichthyol, ^{etc.} and thymol. The writer used antipyrin, in 15 grain doses, at the onset of threatened attacks of

filarial fever, with apparent advantage in a few cases.

Should an abscess form it is to be opened; when lymphangitis or adenitis supervene, ^{it is} they are to be treated as in ^{cases with} less specific

1) Cause. ~~cases~~ local applications of heat or cold are agreeable and help to relieve pain; and should the temperature run high, the

usual remedies ^{may be employed} will suffice to control it. When the pain is attributable to adenitis, dependent upon the density of the

gland-capsule, it is expedient to divide ^{The capsule} it subcutaneously.

claw.

ELEPHANTIASIS of the EXTREMITIES. -

The lower extremities are much more liable to be attacked by elephantiasis than the upper ~~limbs~~. In advanced cases of the disease the bulk of the foot and leg is enormously increased, and ^{they} truly convey the idea of elephantoid enlargement. The first parts to show signs of deposit in the subdermal tissues are the foot and ankle. The dorsum of the foot especially shows a thickening and enlargement of a hard, dense, incompressible tissue, giving the whole foot a lumpy appearance, the toes projecting as thickened stumps from the end of a misshapen mass. When attacks of fever supervene, the lymphatic tracts in the limb are red and swollen and painful; and the glands towards which they converge are enlarged and tender. As the inflammatory signs and symptoms abate, a hard, dense, thick cord may be felt along the course followed by the lymphatics of the limb, ^{which} ~~and the reddish~~ ^{colour} assumes a dusky hue.

With each recurring attack the area of hypertrophy extends, until, in course of time, the whole lower limb is involved and even the lower part of the abdominal wall becomes affected. At times vesicles form on the skin; these may burst, and from the openings a milky fluid may ooze, giving rise, when it dries, to crusts and scabs.

N.H.

Abscesses are not infrequently met with, which, when opened, have in some instances been found to contain a parent filarial worm.

Here, as in elephantiasis scroti, the disease may show itself in the form of a varicose condition of the lymphatics, giving rise to the terms varix lymphaticus and naevoid elephantiasis. These are but modifications of the more acute form of the disease, obstruction more than inflammation serving as the cause. On the lymphatics thus dilated, tubercles and vesicles appear, varying in number from a few to hundreds. When these burst or discharge, a coagulable lymph exudes, which ^{varies} varies in appearance from straw-colour to red, and in quantity from a few ounces to a few pints in the twenty-four hours.

Associated with the elephantoid fever, ^{and} ~~associated with~~ hypertrophy of the lower limb, chylous urine is frequently present, showing that the lymphatic tracts of the ureter and bladder are simultaneously and similarly affected.

In time the limb becomes enormous, measuring, it may be, a couple of feet round the ankle; the muscles waste, the limb is an inconvenience, and the surgeon is consulted as to the possibility of removing it.

As Treatment. Short of removal several therapeutic agents may be tried. Elevation of the limb reduces the size; firm bandaging helps to diminish the bulk; application of a rubber bandage does good as far as support and compression can; but all these are merely palliative; so also are leeching, blistering, and blood-letting.

no pt
Ligature of the femoral artery has been tried; but the treatment seems misapplied, and Sir Joseph Fayrer strongly condemns it, after having given it a trial;

8
The only thing left for the surgeon to do is to amputate if the patient desires to be rid of the inconvenience caused by the bulky limb. There is no reason why the operation should not be undertaken leaving the ordinary dangers of amputation out of *account* account with a view to alleviation; but ^{*the ensuing of a*} ~~that~~ permanent cure will ~~sure~~ depend upon the position and vitality of the parent-worm in the system.

Can

E. Elephantiasis Scroti.

Compare with
Dimitrie

51

loids about with him constantly.

Elephantiasis scroti.

The scrotum is a favourite seat of ~~attack in the disease~~
Elephantiasis; and its lax tissue, dependent position, and rich

lymphatic ^{supply} endowment render the parts at times enormous. Commenc-

ing ^{perhaps} as a lymph-scrotum ^{or as an attack of lymphangitis} the result of blocking of the horizontal
inguinal lymphatic system by filaria sanguinis hominis, the

scrotum gradually increases in size. The thickness and coarseness

of the skin renders it corrugated ^{and} fissured, ^{to} ulcerated and covered

with scabs and crusts; lymph at times flows from the scrotum; in

some cases clear and serous-looking; in others, thick and milky in

appearance. The subcutaneous tissues thicken, increasing the

bulk and weight of the scrotum. The tissues over the spermatic

cord hypertrophy, causing the inguinal canals to dilate, ^{so that} and not

unfrequently a hernial protrusion ^{results} traverses the centre of the ele-

phantoid mass, reaching, it may be, even to the scrotum. ~~The~~

Hydrocele of the tunica vaginalis is a frequent concom-

itant; and cysts with fluid occur along the spermatic cord. The

fluid ^{may} ~~may be~~ clear, but ^{contents usually} ~~is~~ more often thick and milky, coagulating

readily when drawn, and separating into a dense, ^{fibrous} heavy, stringy

mass of albuminoid matter and a serous fluid. Hydrocele may be

an early notification of the existence of filaria; and the first

intimation ^{and} the surgeon ~~gets~~ that the patient is the subject of the

disease, ^{may find} may be, when, on tapping what seems an ordinary hydrocele,

the milky fluid characteristic of filarial infection, flows through

the cannula.

are usually

(2)

The inguinal glands at all times, after even one or two attacks of filarial fever, become matted and indefinite in outline, and after several recurrences remain permanently prominent. The scrotum becomes so bulky in time and so developed, that the skin and lower part of the abdomen ^{are} ~~is~~ dragged downwards, ^{it were} so that the hair over the pubes seems as though growing from the upper part of the scrotum itself. The skin of the penis ~~does not escape the disease; it becomes hypertrophied, elephantine and of such~~ dimensions that the penis itself is embedded deeply, out of sight, and the orifice through which the urine finds exit, looks like a deeply sunk navel in the midst of a huge mass of hypertrophied tissue.

Treatment.

Without repeating the medicinal or palliative treatment detailed above, it is merely necessary to state what good removal can do, and how it is best accomplished. Removal of the scrotum is chiefly undertaken with the idea of ridding the patient of an inconvenient tumour. ^{as to} The mass may assume dimensions in bulk and weight which preclude ^{him} the patient, not only from earning his livelihood, but also from getting about. Tumours of great weight are recorded—several over 100 lbs. ^{pounds 175 and} Sir Joseph Fayrer removed one of greater weight than the patient ^{weighed} himself after its removal. The writer removed one which turned the scale at 49 ^{pounds} lbs. after the blood and fluids had escaped from the tumour.

The curative effects of removal will totally depend upon whether or no ^{the} parent-worm is located in the lymphatics of the scrotum. If such good fortune should obtain, then removal of the scrotum is at once palliative and curative. ^{otherwise} ~~should~~, however, am-

putation ^{mainly} but free ^{from} the patient of an inconvenient mass, whilst the author of the disease is hidden elsewhere, then but a temporary benefit is expected or possible.

The danger of the operation upon large tumours ^{is, are:} first, the immediate shock to the patient; and, secondly, the primary haemorrhage ^{caused by} met with. Were the organs known to be amyloid, the heart fatty, and the patient in consequence much emaciated or weakened, operation can only hasten death. When, however, the patient is young and the organs fairly healthy, operation is in no way contra-indicated, as the haemorrhage may be controlled so as to render the quantity of blood lost ^{unconsiderable} within bounds.

Operation on a case of elephantiasis scroti of large dimensions is ^{conducted} ~~performed~~ as follows: The patient is prepared for operation in the usual way, ^{both generally & locally.} The tumour is washed clean, the skin around thoroughly disinfected, the parts swathed in antiseptic dressings for some hours previous to the operation. To empty the tumour of blood it is necessary that the patient assume the recumbent position, and that the tumour be raised ^{about the level of the body}. This can be done by any mechanical means suitable; In some cases, in fact, it has been necessary to sling the tumour from the ceiling or ^{any} fixed support high across the ^{or table} bed. The elevated position ^{helps} ~~also~~ to reduce any hernial protrusion that may be present. The patient, before the tumour is ^{clamped} ~~thus dealt with~~, should be placed on the operating-table, and ^{allowed to} remain there, as, if the tumour is ^{permitted} ~~allowed~~ to become pendulous whilst he is being conveyed or carried from the ward to the operating-room, the blood, lymph, or hernia will return to the part.

54
Whilst the patient is passing under the influence of an anæsthetic, some surgeons recommend that the scrotum be examined, and the Knife drawn along the root of the tumour, so as to mark off the line where the diseased and the healthy tissues met, otherwise it may be difficult to follow the exact line after the parts are thrown into corrugations by the compressing elastic cord. Instead of an incision the junction may be indicated by coloured pencil or ink.

The patient, when ^{completely} anaesthetised, is brought to the edge of the table in the lithotomy position. A stout Esmarch's cord is passed round the root of the tumour, the centre of the cord being opposite the centre of the tumour below, the ~~wound~~ ends carried up over the pubes, crossed and fixed behind the body in the lumbar region. To prevent the elastic cord slipping when the operation is commenced, strips of a roller bandage are looped over the ^{tourniquet} cord, one at ^{each} side of the perineum behind, ^{and} one at ^{each} side of the pubes in front. The ends of these bandage-slips are either tied in position or given to assistants to hold. Three ^{skilled} assistants are ^{required} wanted, one to support the tumour, and two others—one on ^{each} side—ready with ^{clip-} ~~Spencer Wells~~ forceps to seize bleeding vessels.

The antiseptic dressings are now removed and the operator takes his stand opposite the tumour. The first thing to ^{be} done is ^{to} ~~pass~~ ^{before the penis & testicles, this is accomplished by passing} a long grooved director down through the preputial orifice as far as possible. The end of the director is made to hug the upper wall of the channel; and when bottom is struck it is made to protrude on the dorsal aspect of the cutaneous covering of the penis. The point is cut down upon and made to protrude, and the skin is slit up by passing a bistoury along the groove in the direction from the root towards the free edge of the prepuce. The glans will then be laid bare, ^{when it} ~~The penis~~ is seized ^{by} the ^{fingers} ~~hand~~ and the coverings dissected off, until the penis is freed for a length of ^{some 4 or 5} ~~four~~ inches. The penis is now wrapped in boracic gauze and kept out of the way.

John.

The next step is to dissect out the testicles and cord. This is done by making an incision from over the pubic spine on ^{each} either side, downwards, for a sufficient distance to expose the cord. The length of the cord in very large tumours is considerable, and the exact location of the testicle ^{is} equivocal. When the cord is found, however, the tissues may ^{be cut downwards} freely ^{along it} in the direction of the cord, until the testicle is seen. The testicle and the cord are then freed ^{from} the surroundings, partly by cutting and partly by tearing the tissues. ~~During the process~~ a hydrocele may be cut into ~~a matter of no moment~~. Should a hernia be found, it is to be dealt with appropriately, and the testicles and cord, wrapped in boracic gauze, ^{are} and thrown up on to the abdominal wall. The further steps of the operation consist in uniting the incision made over the penis and cord by a transverse incision on ^{each} either side, and then by a bold sweep of the knife (a large amputating ^{ing} knife), remove the mass, cutting from the incision over the right cord, carrying the knife low down between the scrotum and perineum, and then upwards round the left side of the tumour until the incision over the left cord is reached. A few strokes will free the connections, and the tumour is received into the hands of the assistant. ~~The compression of the tourniquet now being~~ ^{lost} the hemorrhage that ensues is at times terrific, but not by any means uncontrollable. Vessels are seized and tied or twisted, and attention is ~~now~~ directed to the condition of the margins of the wound. If they are diseased, as ^{cut off} proved by their induration, they may be clipped off by the scissors or removed by the knife. The state of the ~~testicles~~ ^{testicles} is now ex-

2 aminated; and if they are fairly healthy, they are to be allowed to remain, but if one or other or both are hopelessly withered or diseased ^{they must} then ~~are they to be removed.~~ ~~When their future is settled the indiarubber tourniquet is to be relaxed and the consequences upon bleeding vessels watched.~~ The part should be wiped with a warm sponge and the ^{complete} arrest of haemorrhage ^{ensured} ~~established~~.

3 The subsequent steps merely consist in applying unirritating antiseptic dressings, as no attempt can, or need be, made to bring the edges of the skin together. The testicles, if present, are placed on the front of the perin~~x~~eum, the penis wrapped up in wet boric lint, or strips of lint soaked in carbolic oil, or dusted over with boric and starch powder, iodoform, or ^{come such} ~~other~~ antiseptic ~~powder~~. The perin~~x~~eal wound ^{is} similarly treated, and the surface supported by ^{protective} antiseptic wool, gauze, or tow; a T-bandage, with a slit for allowing of urination, is applied to support the dressing, and the patient ^{is} removed to his bed. Dressings are to be subsequently applied according as the case proceeds.

2/ The results of this operation are surprisingly good, ~~an average of 95 per cent of cases operated upon recovering.~~ The parts cicatrize in a way which ~~astonishes~~ ^{is} ~~surprising~~.

are covered, and the testicles enclosed by a cicatricial tissue, which acts as a good pocket for their bestowal. Unless the testicles have been removed or are wholly atrophied, sexual power remains; and the writer's patient, from whom he removed a weight of 49 ^{pounds} ~~lbs.~~ and left but one testicle, became the father of a child ^{subsequently}.

3 ~~ly.~~ What ^{after =} the subsequent history of such cases ~~is~~ has not been satisfactorily reported. That the disease does return in a few

cases is known, but it is also known that for ~~several~~ ^{many} years afterwards cases have remained ^{free from} with no recurrence. So far as the ~~mere~~ removal of the mere tumour in elephantiasis scroti is concerned, the operation is entirely satisfactory; but as a cure of the disease ^a ~~filariosis~~ ^{all} depends upon whether the parent worm is included in the amputated part ~~or not~~.

clear Sequelae of Filarial disease. -

58

There are several sequelae and concomitants of filariae which call for surgical interference.

see V RETENTION of urine during an attack of chylous urine is not an uncommon condition. If, by percussion, the bladder is found to be full, or if the patient is distressed, a full-sized catheter ought to be passed, ~~and~~ ^{when} ~~should~~ clots of coagulated albuminous material ~~will~~ clog the channel of the instrument, a gentle stream of warm boracic solution will free the passage, and aid in the breaking up of the clot.

Curse type

Loz V Filarial orchitis is by no means a common ailment, but it is just possible, as suggested by Manson, that the "malarial orchitis" of some French authors may prove on closer investigation to be filarial ~~rather~~ ^{*filarial orchitis*}. If diagnosed, as it can be when other signs and symptoms are met with in the patient, ^{*Treatment*} the testicle is to be ^{*this same as that of*} dealt with as when orchitis occurs from other causes.

see V TUMOURS ^{*the*} of lymphatic nature peculiar to filarial infection ^{*are*} is met with in almost any part of the body. The Mammariae may be the seat of the disease; and huge, dependent benign enlargements of the breast may result. When ~~expedient~~ the breast is to be supported, relieved, or removed according as the conditions require. Here and there on the limbs or trunk, and on the vulva, tumours of a filario-elephantoid nature occur. The tumour of the vulva at times attains an enormous size, and at first sight, ~~it~~ seems as though it were certainly a pendulous scrotum, and ^{*with which the surgeon*} not a vulva ~~that~~ had to be dealt with.

8 pt Center
FILARIA MEDINENSIS --- GUINEA WORM. ---

In several Tropical countries there is to met with, in the
connective tissues of the human body, but more especially in those
of the lower extremities, a long, delicate, worm deeply imbedded.
The countries in which this disease occurs are Central India,
Persia, Turkestan, Arabia, Central and West Africa, Brazil, in
a limited area. The disease is, during certain seasons more
prevalent than others, and it happens that in some localities,
as on the west African coast, almost every native suffers.
The worm, of which the female only is known, is from 1 to 3 1/2
feet long, and about 1/10 of an inch in diameter. Although usually
met with in the legs, it may be found in any part of the body—
head, arms, scrotum, etc.

The presence of the worm is made known by the development
of a small ulcer, at the bottom of which is to be seen an
opening leading down to a ^{recess} ~~space~~ which contains the worm.

^{at} ~~the~~ the fistulous opening a close examination will show
a filiform-looking body, which is in fact the tail of the ^{animal} ~~worm~~.

If the part is well soaked with water, the protrude ^d piece of
the worm will swell up rather suddenly, ^{and} it will then be seen &

to burst, and when the fluid-looking contents ^{are} examined
microscopically, they will be found to be ^{a mass of} ~~the~~ embryos of the
worm. Each embryo measures about 1/30 of an inch in length, and

united

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60

^{1.7th}
~~1000~~ of an inch in breadth. The microscopic ^{al} field ^{displays an} enormous number of small worms coiled ^{up} like a watch spring, or partly unfolded like a comma. Active movements characteristic ^{ze} h them, and their power of attacking the cyclops can be readily ~~de~~ demonstrated. The fresh-water cyclops is the small crustacean, ~~in~~ which Fedschenko, while resident in Turkestan, found to be the intermediary host ~~and~~ in which the parasite developed. ~~It~~ is inferred from this observation that it is through the ingestion of water that the guinea-worm gains access to the ~~human~~ human body.

Clar. ^{plan} Treatment.- The old-fashion of seizing upon the protruding part of the worm, and entangling it in a piece of wood, ^{that} which was day by day twisted so as to draw the worm from the wound, ~~is~~ is not a good ^{method.} ~~means of getting rid of the worm.~~ ^{The delicate} ~~that~~ animal frequently breaks under the treatment, and, in consequence, the parts around become injected with, and inflamed by, the infiltrating embryos. Instead of this plan, ^{others} several have been devised. What might be termed the physiological, ^{thus} ~~one~~ is, by keeping the part well soaked with water, the female is thereby encouraged ^{to} to go on shedding her embryos, until, after some 14 days, she becomes exhausted, and can then with but little difficulty ~~can~~ be dragged from the wound. Another, the therapeutic plan, is to inject, as recommended by ~~Moss~~ ^{Mercuric chlorid} Emily, the protruding part of the worm with a 1:1000 solution of Perchloride of Mercury. Then, ^{thirdly,} there is the surgical plan of cutting down and evicting the worm.

In tropical practice no disease requires of the medical practitioner more skill in diagnosis and treatment than does abscess of the liver. The inception of the malady is so insidious, the existence of pus at times so obscure, that it is only by careful study and long experience that the ^{physician} ~~medical man in tropical~~ ~~practice~~ can become either capable of diagnosing or of treating the condition. ^{Inflamed Liver -} Inflammatory and congested states of the liver are a daily experience in the tropics; yet, with all due attention and acumen, pus in the liver at times escapes the most able practitioners. Not only is the newly-arrived medical man likely to falter in his diagnosis; but even men with long experience of this particular ailment are apt to fail at times in recognising the disease from the signs and symptoms.

Treatment of inflamed Liver.

~~Inflammation of the Liver.~~ Be the cause what it may, inflammation of the liver, when of a persistent character, can be, and frequently is, relieved by surgical treatment. When the usual remedies - counter-irritation applied externally, draining of the liver by inducing purgation and relief of the portal system by drugs, and baths, wet packs, &c., fail to afford relief, great good is obtained by bloodletting. In former days blood was withdrawn by venesection at the elbow, leeches applied around the ^{anus} ~~arm~~ or over the liver; and ^{by} ~~from these~~ ^{a certain} ~~a maximum of~~ benefit was obtained; but with modern instruments it is possible to withdraw the blood from the organ itself. The aspirator, now accomplishes more immediately

(Should be withdrawn)

and thoroughly what the lancet attempted, and by ^{the use of which} ~~its~~ use hepatitis is ^{often} ~~more~~ readily subdued. There is no difficulty or danger in hepatic aspiration, ~~anyone familiar with the instrument can use it in hepatitis; and it only requires to have been applied in a few cases to convince one how simple its application is, how free from danger and what immediate benefits result.~~ ^{being extremely simple.} The beginner in tropical practice is apt to look upon hepatic aspiration as a formidable 'operation', but a little experience removes the proceeding from the bugbear of an 'operation' to an easy means of venesection. In most cases a general anesthetic is unnecessary; local anesthesia, by salt and ice, by a freezing spray, or by cocaine, will allay the pain of the skin puncture, and after the skin is traversed there is but ^{little} ~~little~~ fear of pain. ^{Sometimes, however,} ~~The writer has,~~ however, ^{is} ~~on several occasions found~~ acute pain induced in the right shoulder, ~~within the acromio-clavicular angle,~~ during the deep passage of the needle. ~~On these occasions~~ ^S ~~The~~ pain seemed ^S to occur when the needle traversed ^S the diaphragm, and it is but natural to suppose that wound of a large branch of the right phrenic nerve ^{was} ~~was~~ the occasion of the ~~unfortunate~~ coincidence. Before inserting the needle of the aspirator ~~it causes less pain and a less difficult wound to heal if~~ a small incision in the skin is made by the knife. The needles of the aspirators in common use are usually too short for tropical work. ~~It must be remembered that~~ ^{In} hepatitis the liver is greatly increased in bulk, and as ~~the ob-~~ ^{the} ~~ject of the treatment by aspiration is to reach a large-sized~~ ^{the} ~~branch of either the hepatic or portal vein, and as these are~~ ^{and therefore} ~~deeply seated, the needle requires to be at least~~ ^{must} ~~six~~ ⁶ inches long.

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Indeed ~~a~~ needle of ~~nine~~ ^{eight} inches in length ought to be supplied with every aspirator made for use in the tropics, as at times a needle short of that will not reach the seat of an abscess if approached from the right lower costal region. The needle used for hepatic phlebotomy should be ⁶ ~~six~~ inches long and of the widest size made.

The initial puncture is best made in the axillary line, between the sixth and seventh or the seventh and ⁸ ~~eighth~~ ribs; or anywhere in the lateral lower right costal region where hepatic dulness is pronounced. When phlebotomy pure and simple is intended, the needle ought to be driven up to the hilt, the tap connecting it with the exhaustor opened, and the needle slowly withdrawn. Should a fair-sized vein have been traversed, blood will flow freely from the needle when the point lies in the channel of the vein. When the quantity of blood ² ~~advisable~~ to be withdrawn is obtained, the needle is pulled out, the wound covered with a small, thin pad of cotton-wool soaked in collodion, and a firm roller-bandage applied round the costo-abdominal region. It is best to begin to bandage from below upwards, covering the body from immediately above the umbilicus to just below the nipples.

Should little or no blood escape when the needle is first introduced, it may be partially withdrawn and again pushed home taking a direction more backward. If disappointed ~~again~~, the ^{same} ~~same~~ manipulation is to be repeated, but the point is to be made to travel more forward. Should blood still refuse to flow, the needle may be completely withdrawn and re-introduced either further forward or further back, according as the hepatic dul-

ness indicates. As many as half-a-dozen punctures may be safely made in the search after blood (or pus: see below). Practically, the dangers attending this operation are nil; ~~theoretically they have been attempted to be proved to be many.~~ The danger of perforating the lung, the possibility of pneumothorax, the injury to the diaphragm and the escape of blood (or pus: see abscess) into the cavity of the peritoneum are a few of the inferred dangers and possibilities. ~~None of these have any real existence in practice.~~ ^{where no} The punctures of the lung, pleura, and diaphragm have never been known to give rise to any untoward symptoms, and the escape of blood into the peritoneum is harmless. That blood does actually flow from the puncture in a congested liver the writer has had the opportunity of proving. While tapping an ascitic abdomen by the ordinary method with a trocar and cannula introduced between the umbilicus and pubes, ~~he~~ ^{the writer} plunged the needle of an aspirator into the enlarged liver. In a few minutes ^{after} a good many ounces of blood were ~~drawn off~~ ^{obtained, the needle was with drawn} and as the ascitic fluid continued to flow through the cannula, the straw-colored fluid became tinged with blood. Towards the end of the ascitic flow the fluid became very deeply tinged with blood, proving that the punctures in the liver were bleeding freely. No doubt when the wounds were closed, blood escaped for some time into the emptied peritoneal cavity. The patient, it may be mentioned, made an excellent recovery, and it is interesting to know that after seven tappings—extending over eighteen months—the patient (a Chinaman) made a complete recovery.

Foot
Note
L.C.

Jones. *Clair*

Abscess of the Liver: - The ~~question of the seat and etiology of liver~~
~~abscess become~~ ^{affairs} ~~pertinent~~ ^{questions} when the prognosis as to the beneficial
 effects of operation, ~~is considered~~ ^{has to be given}. Abscesses may be suprahepat-
 ic, intrahepatic, and subhepatic, and, in the opinion of the writer,
 the seat of the abscess has to do with the cause of the disease.
 The question of the association of hepatic abscess and dysentery
 is a vexed one; and most medical men try to induce patients suf-
 fering from hepatic abscess to confess to a previous dysenteric
 attack. This, however, is not in many cases successful, and the
 denial is not received in good part nor is it received with due
 appreciation. ~~The fact is most tropical practitioners believe im-~~
~~plicitly in dysentery being an antecedent of liver abscess. This~~
~~is no doubt true in many cases and liver abscesses are frequently~~
~~associated with dysentery.~~ ^{however} Whether ^{he} dysentery ^{is} an antecedent,
 a concomitant, or a sequela of ^{liver} ~~the~~ abscess is ~~again~~ a question in
 dispute, many believing that the dysentery is induced by the hep-
 atic state. In the writer's belief intrahepatic abscess is fre-
 quently, in fact ^{generally,} ~~mostly,~~ a sequela of dysentery, or, at any rate,
 intimately associated with it. Suprahepatic abscesses, ^{wrongly} ~~frequently~~
^{classed with} ~~misanamed~~ subdiaphragmatic abscesses, on the other hand, may, and
 in fact do, develop independently of dysentery altogether. To
 make this clear, the writer's opinion as to suprahepatic abscess
 will be first stated.

Ex r m

Suprahepatic abscess *(Abscess of the back of the liver)* *(Abscess of the Dome of the Liver)* - In
 the region between the liver and the diaphragm, a collection of pus
here ^{is} ~~met with,~~ ^{is encountered} in frequency sufficient to constitute it a special

Jones
 disease. Of 27 cases of abscess of the 'liver' ^{shot} which came with-
 in the writer's notice and treatment, 20 ^{were} came under the category
 suprahepatic; the remaining ^{seven} five being classified as intrahepatic
 (or ^{sub} four intra and ^{one} one subhepatic). The verification of the pos-
 ition of several of these abscesses was obtained at post-mortem
 examination; and the fact of pus on the dome of the liver being
 a separate disease ^{established} forced upon one by clinical and pathological
 evidence.

hal
Anatomical and Pathological Characters. - On ^{du} performing a post-
 mortem examination upon a case of Suprahepatic abscess of the
 liver, the first point towards which attention is directed is
 naturally the liver itself. On viewing the liver after opening
 the abdomen, it may be seen ^{that the liver is} to be perfectly natural in size, shape
 colour, and consistence. ^{On examination of} Thinking a mistake in diagnosis has been
 made and knowing that pus had been drawn off in the lower right
 costal region, the right chest and pleura are examined. Here the
 costal and visceral pleural layers may be smooth, glistening, and
 normal. No sign of pus or inflammatory change is to be seen, and
 the writer has known the post mortem examination given up at this
 stage in the belief that the abscess had healed, and that ~~the cause~~
^{Some other disease had} ~~of~~ death was something else. By closer examination of the lung it
 will be found that it cannot be raised from the diaphragm, and on
 turning to the hepatic region, it will be found that the coronary
 ligament of the liver appears to bulge abnormally. Here, within
 the folds of the coronary ligament, is the seat of the disease, the
 boundaries of the locality ^{only} above the diaphragm; below the piece

1 *is*
 of the liver destitute of peritoneum; and circumferentially the
 peritoneum passing between the liver and diaphragm forming the
 coronary or suspensory ligament. The pus may have mostly escaped
 through an opening in the diaphragm above, and when the tract of
 pus is followed it will be seen to have burrowed through the lung
 and found its way towards and into a bronchus. The liver surface
 will be seen to be scooped out to a variable depth, the maximum
 being ~~three-quarters~~ ^{3/4} of an inch, and the exposed surface covered
 with inflammatory material, ~~natural to a purulent surface~~. The
 peritoneum around will be seen to be thickened in the usual way.

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 LC
~~Touching the liver at the spot where it is destitute of~~
~~peritoneum we find~~ ^{PT} the inferior vena cava and the right supra-
~~renal capsule, but it is to neither of these that the inflammat-~~
~~ory troubles are attached. Here the lymphatics leave the liver~~
~~and pass up on their way towards the thoracic duct. It is in the~~
~~lymphatics that the inflammation commences, and the lymphangitis~~
~~induced goes on to suppuration. We know from the researches of~~
~~Dr. Vaughan Harley the connection between the liver functions and~~
~~the thoracic duct. Dr. Harley has shown that when the ductus com-~~
~~munis choledochus is ligatured, jaundice ensues; but that when, in~~
~~the same subject, the thoracic duct is ligatured, jaundice fails to~~
~~appear~~ ^{show}. This experiment proves that the coloring and other matters
 of the bile gain entrance through the blood ~~through~~ ^{by} the thoracic
 duct; and to gain the thoracic duct they must escape from the
 liver by the lymphatics. The writer contends that when the liver
 is subjected to sudden chill, causing congestion, hyperemia, and,

LC/ it may be, inflammation, the lymphatics become affected, block and breaking down cause ^{ing} a supra-~~or~~ subhepatic abscess.

It will thus be seen that there is no preliminary dysentery required to account for the disease, and it is well-nigh impossible to understand how dysenteric infection, fluid or embolic, could primarily affect the lymphatics (leaving the liver ~~alone~~).

(1) The chief cause of the ailment is chill. Just as in temperate regions exposure gives rise to chest troubles, bronchitis, pleurisy, and pneumonia, so in tropical countries it is the liver which is attacked, causing hepatitis, perihepatitis, or suprahepatitis.

atc Signs and Symptoms: The ~~onset of~~ symptoms which lead on to suprahepatic abscess are: a sudden pain in the right lower costal region; deeper seated than ~~the~~ the pain is ~~deep seated, pleuritic~~ pleuritic pain and the character of the pain less sharp. There is difficulty, or rather dread, in breathing, and fever (102 or 103 ^{7.} degrees) with its usual accompaniment of nausea, headache, backache, foul tongue, dry skin, and hard pulse.

By rest in bed and appropriate treatment the acute symptoms may subside, admitting of more careful examination of the chest. On percussing out the liver it will be found that the lower border does not advance appreciably below the normal level. The surface of the liver itself shows but little tenderness to percussion, and ~~it is only~~ ^{but} when the liver is grasped by one hand over the right lumbar region, and the other in the epigastrium, that the sharp pain shooting up to the acromio-clavicular angle is

elicited. Percussion along the upper border of the liver, however, betrays the nature of the disturbance. ~~Along the upper border of the liver~~ ^{Here} there will be found an abnormal area of dulness extending upwards ~~towards~~ and encroaching on the right lung. In the early stages the dulness ~~will be found to be~~ ^{is} in the axillary line; but as the disease advances, and more especially in the later stages when pus has formed in some quantity, the dull area is met with more in the nipple-line or even internal to it. The shape of the swelling alters. In the ^{early} stages it is round and more diffuse; ~~in the later stages~~ ⁹ it assumes an almost conical shape with its apex upwards and the base continued into the general mass of the liver. At times the swelling can be readily ~~made~~ ^{discern-} ~~out~~ ^{ed}, the lung-tissue around being normal as regards resonance and vocal fremitus. But the condition of the lung varies from day to day, almost from hour to hour, and the area of dulness may at consecutive examinations puzzle the surgeon, ~~not a little~~. When the increased area of dulness is present, the surgeon is satisfied that operative measures must be forthwith undertaken; but, if a few hours, or a day, intervene before the next examination preliminary to operating, the operation, in deference to the clearing up of the lung, may be postponed. So pronounced may be the improvement in the condition of the lung that it would seem as though the whole trouble were about to resolve. This, however, ~~in almost every case~~ ^{and some later} proves illusory, and if the surgeon ~~defers~~ ^{usually} his operation in accordance with this belief, he will be corrected in his opinion ~~by~~ ^S the patient suddenly coughing up a quantity of pus.

This may be a fortunate ending to the train of symptoms, but it is a condition which no surgeon is justified in waiting ~~for or allow-~~ing to take place. When the suspicion of pus is present no delay is warranted, and the ~~delusive~~ ^{an delusive} symptoms of temporary clearing up of the lung condensation ~~are not to enter into the question.~~ As ⁱⁿ the preliminary to dealing with the pus, ~~is~~ ^{is} exploration of the liver by a long aspiratory ^{not any} needle there need be no hesitation in advancing the diagnosis by employing this harmless procedure. In hepatatis it is done with the idea of phlebotomising the organ; but if pus is suspected ^{it} is necessary to have all the instruments ready in case pus is found. If no pus is found, whether it is actually there (but missed) or not, good only can result to the inflammation by the needle punctures.

Birmingham.
OPERATIONS. - I propose to arrange the treatment of liver abscess ^{will be considered} ~~be they~~ ^I ~~supr- or intra-hepatic~~ ^{under} into two groups, the Method ^{the method} by trocar and cannula, and by incision.

- A. Operation by the TROCAR and Cannula. ^{method} I place this first because I am convinced of its ^{is} ~~superiority~~ ^{in account of} its simplicity ~~its~~ and the better chances of recovery it affords the patient. If deep-seated abscesses are to be reached, the trocar and ~~cannula~~ ^{is} ~~is~~ most efficient, and with this instrument the surgeon will be induced to operate at a much earlier stage than if ~~the~~ the knife is to be relied upon. Given pus between the liver and diaphragm situated some ⁴ ~~four~~ or ⁵ ~~five~~ inches from the surface, to reach the pus by a cutting operation ~~is~~ a task few

practitioners

surgeons care to undertake at an early stage of the disease.

71

Of course, if the abscess has been neglected and allowed to run its course, and to bulge or point either in the costal region or

towards the abdominal wall in front, an incision may be and ~~no doubt~~ is effectual. But deep-seated abscess of the liver, and few are not so in their initiation, should not be so ~~dealt with~~. ^{heated.} The

~~trocár and cannula can be used at the earliest stage with~~

~~benefit to the patient, and at a time when any other means is~~

~~attended with great risk.~~

The use of the ^{incision.} ~~knife~~ in preference to the puncture, is one of the causes which leads to delay in operating & on this ground alone the latter is to be preferred.

Operation:—After administering an anaesthetic, the aspirating-needle is introduced in the same way and with the same precautions as in hepatitis (see above). Should pus flow through the needle it must be immediately withdrawn, as it is not desirable to empty the abscess-cavity. Having by this manipulation settled the position and depth of the pus, the further steps are as follows. With a large trocár and cannula, measuring in length from tip to handle-root ^{of the trocár} six inches, and in diameter not less than $\frac{3}{8}$ of an inch, puncture the side, entering at the same point and pursuing the same track as that followed by the pioneer needle. The depth to be gained will be gauged by the depth at which the ^{aspirator} needle reached pus. When the trocár and cannula have ~~reached the prescribed area~~ ^{has penetrated the ~~prescribed~~ area} ~~(prescribed)~~

When pus appears,

withdraw the trocar, ~~and it is well to~~ close the orifice of the cannula by placing the thumb over it so as to retain the pus until the tube is introduced. The next step is to introduce an indiarubber tube of a large size—larger than the calibre of the cannula. To effect this the probe here ~~figured~~ ^{described} is passed along the tube and made to catch into a slit near its end. The probe is a stout piece of steel, ^{one} foot long, measured off in inches and with blunt divided ends. The tubing is ~~not less than~~ ^{$\frac{1}{2}$ inch} in diameter, what is known as No. _____ and ¹⁰ ~~ten~~ inches long, with ^{an aperture} ~~some holes~~ cut near the end to allow of the ready entrance of pus. With the tube stretched tightly over the probe it is reduced to a size which renders it capable of being passed along the cannula. When the end of the probe bearing the tube reaches the bottom of the track, that is, the abscess cavity, it is held there and the cannula withdrawn completely, slipping it over the tubing. When the cannula has emerged completely the tube is allowed to slacken and the probe is withdrawn. ~~The position of affairs then, is, that we~~ ^{then} have a wide tube leading to the bottom of the cavity and by its bulk completely blocking up the skin aperture and the various tissues traversed by it. If the pus is, say, ⁵ ~~five~~ inches deep, there will be, seeing that a ¹⁰ ~~ten~~-inch tube was used, half the tube within the chest-wall and the same length projecting from the side. Into the ^{projecting} ~~open~~ end pass a piece of glass tube of a size to fit the drainage-tube and of a length ^{2-4 inches} sufficient to show the character of the pus passing from the chest and the rapidity of its flow. A long piece of tubing is now fixed to the free end of the glass

tube and allowed to pass from the bed to a vessel ^{and} containing some antiseptic fluid. ~~Placed on the floor alongside the bed~~. The drainage tube at the spot where it leaves the chest is to be surrounded by antiseptic gauze or cotton-wool, and secured by a bandage round the body.

An efficient drainage is now established, and the apparatus is allowed to remain until it is seen that the purulent discharge has abated, ~~perhaps a week or two or more~~, and that instead of pus a merely bile-stained, thin fluid drains away. The tubing is then to be cut off an inch and a half from the body, prevented by a safety-pin or by affixing string from the possibility of dropping into the cavity of the chest and the whole covered up by antiseptic gauze and wool.

After 24 hours the tube is to be withdrawn a short distance, say an inch, cut off externally to a suitable length and the effect watched. If favourable symptoms continue, the tube is gradually withdrawn ^{day by day} a little at a time, ~~from day to day~~ until, when discharge ceases, it is completely removed. ^{A smaller tube may be substituted earlier if the track is not quite closed.}

Such is the operation for tapping a deep-seated abscess in the suprahepatic region, and ^{of this operation on} the results in the hands of the writer and others have proved most satisfactory. Four cases thus treated by Dr. Mitchell Cowie in Hong Kong all recovered; ³ three cases treated by Inspector-General Alex. Turnbull, R.N., at the Naval Hospital, Hong Kong, all recovered; and of 21 cases treated by the writer ^{four} 17 recovered and ~~two~~ ^{four} died. The operation here recommended is a modification of the plan of treatment followed by Dr. Manson, and shown to the writer in Hong Kong. It will be observed that no washing out of the cavity is recommended. The

74
resumed in sketch

only cases in which the writer ~~has~~ followed that plan ~~died~~, although, in the hands of other operators, for 'tropical abscess' it seems to have done good. It may be at once stated, however, that for suprahepatic abscess it is an unnecessary and an unwise proceeding. If the diaphragm is intact there will be a tendency to compress the cavity and to squeeze out the pus, as it were, from between the diaphragm and liver. It is quite possible, however, in large intrahepatic abscesses washing might do good.

The length of time a tube may be worn is indefinite. As long as discharge comes it should be retained. It gives rise to no inconvenience. One patient operated upon by the writer went through the Chino-Japanese ~~war~~ *with the tube in his side* ^{*war correspondent*} campaign as a ~~newspaper reporter~~, and it was only when the war was over that he finally withdrew the tube ~~from his side~~, and threw it in the sea during the return voyage home.

Suprahepatic abscess may be multiple, as may intrahepatic lesions. It is less ~~seldom~~ ^{*frequently so*} they are so, but the writer has seen post-mortem evidence of one or two small unruptured abscesses between the layers of the broad ligament alongside of an abscess ~~which~~ ^{*slit*} had been tapped and drained. ~~The condition thus described~~ ^{*Flux is frequently*} best illustrates the cause of death after tapping and draining a suprahepatic abscess. ~~it is that another has formed alongside.~~ ^{*usually*} If after successfully reaching and draining an abscess, the symptoms do not rapidly improve, ~~one's~~ ^{*one's*} suspicions ought to be roused that another abscess is present. In such circumstances ~~no time ought to be lost to search for it and, if found, to drain it.~~ *it must be promptly found and drained.*

Intrahepatic Abscess.— An abscess in the substance of the liver may be, and often is, associated with dysentery, ^{and} ~~The abscess may form~~ some time after the attack of dysentery has ^{passed} ~~passed away~~. The connection between the two diseases is accounted for by the absorption from the surface of the intestine of infective products, which, gathered by the radicals of the portal vein, are caught in the branches of that vein in the liver. If this etiology be the true one, it is not surprising that multiple abscesses are present, ^{in fact it is astonishing that liver abscesses are not always multiple.} ~~This explanation of the causation of liver abscess is not in accordance with what takes place~~ ^{Although} ~~when~~ ^{ulcers of the intestine from other causes—typhoid, tubercular, cancerous, &c.—are present.} ~~It is rare~~ ^{an} ~~indeed that they are followed by abscess of the liver, and the circumstance is used as an argument against the ulcers of dysentery causing hepatic abscess.~~ ~~But, it must be remembered that dysenteric inflammation of the intestine is of a totally different nature to that met with in other diseases. The attack is rapid in its onset, violent in its behaviour and associated with gangrenous and degenerate processes, little calculated to obliterate the veins, but rather to leave them open and ready to transmit infective fluids and particles.~~

No 4
^{*Intra*} Dysentery, therefore, is well-nigh ^{almost} a constant antecedent to true hepatic abscess; ~~and the writer would impress upon tropical practitioners the necessity for recognising the distinction between intra and suprahepatic inflammatory and purulent lesions.~~ ^{traces important}

Russell
A hepatic abscess may attain enormous size. One half of the liver may be converted into a bag of pus, whilst the other half remains healthy and carries on the work of the economy. Hepatic abscesses may be, on the other hand, numerous, although one frequently predominates and develops whilst the others remain in abeyance.

The course of this
Suprahepatic abscess always tend to travel upwards, towards the chest, i.e. intrahepatic
abscesses may burst into the stomach, duodenum, or colon; into the peritoneal cavity; ~~into~~ the cavity of the pleura, or ~~they may~~ perforate the lung and reach a bronchus; or ~~the abscess~~ advance and reach the abdominal wall. It is when the last direction is taken that surgical interference is pronouncedly called for. An abscess pushing forwards towards the anterior abdominal wall causes inflammation of the peritoneum on the liver and on the parietal patch opposite. At first ~~friction~~ *perihepatic* can be felt or ~~heard~~ *pericardial*, but as the peritonitis advances the two surfaces become bound together, and on auscultation it will be found that in the centre of the area no friction-sounds are to be heard, but in a circle around they are distinctly present. This condition of parts guides the operator where to cut or puncture—namely, in the centre of the dull patch where the peritoneal surfaces are firmly adherent, and where a path is formed for the pus to reach the surface. The surgeon, however, anticipates nature by making an incision in the dull area, allowing the pus to escape and inserting a drainage tube. ~~This is a very simple operation requiring but little skill, and very different in its inception and manipulation from abscesses which protrude towards the back of the liver. Here the operation may again consist in cutting down upon the pus~~
that is

through a bulging intercostal space, and inserting a drainage tube, or in putting in a tube through a cannula as in suprahepatic abscess.

Some operators recommend removal of a piece of rib, a wholly unjustifiable step, unless the abscess cavity is enormous, and the delay in operation has allowed the pus to push up and absorb the diaphragm, ^{thereby} ~~and so~~ attaining the nature of an empyema rather than a hepatic abscess.

(in almost all liver abscesses bulging laterally)

Delay in operation has the most fatal consequences in all abscesses in the hepatic area. Careful examination of the liver by percussion and auscultation, combined with the general symptoms and signs when they suggest the possibility of pus, ought to lead to exploratory punctures. To allow an abscess to attain the dimensions and position of an empyema, to occupy a large area of the liver, to advance and point anywhere upon the wall of the abdomen ^{is} ~~is~~ unjustifiable, ~~and are the result of neglect of careful investigation and examination, or an exploded notion that it is~~ ^{is} safe to allow the pus to determine its own course and exit.

248 The result of ~~once~~ ^{such} herniation

^ ^ ^ " ^ ^ ^ " ^ (The) is pernicious

2/ is If the abscess cavity is large, if the chest for some distance forms part of the boundary wall, ~~then is~~ a counteropening is advisable. If the pus in an abscess of such dimensions and adhesions is foul, the cavity may be washed out with a disinfecting lotion. Perhaps creolin (1:600) is the best for the purpose. With ~~a~~ counteropening there is not the same danger in washing out the cavity as when only one opening leads to the abscess.

ital
 In B. OPERATION by INCISION
 I. ~~in~~ the ABDOMINAL WALL.

(ital) (a) When adhesions have occurred. Into the area in which ^{*pus in the liver*} has been diagnosed, an aspirator-needle is thrust, and whilst left in position as a guide, an incision ^{*the cannula is*} is made ^{*some three inches long*} some three inches long in the abdominal wall. When the parietes are fully incised, and firm adhesions are seen to obtain, a sinus-forceps is pushed along the ^{*Cannula as a guide*} aspirator-needle into the abscess-cavity. The needle is now withdrawn and the ^{*(H.S.)*} forceps blades expanded. Through the aperture thus made the forefinger is introduced and the abscess-cavity examined. A large sized drainage tube, ^{*and*} some $\frac{3}{4}$ of an inch in diameter, is inserted, of a suitable length, and when the abscess-cavity is fairly well drained of pus, an antiseptic dressing is applied.

H About this operation ^{*liver abscesses should*} it may be said, that for the sake of the patient, ~~and for the honour of the profession matters may not~~

be frequently allowed to reach such a stage. That a collection of pus should be allowed to collect in the liver, in sufficient quantity to destroy the ~~liver~~ tissue, until such times as the wall adheres to the parietes of the abdomen, ^{*can be explained*} is caused either by the patient having come up for treatment at a late period (a thing not at all likely) or that the practitioner has failed to diagnose the disease. When such is the case, then the operation described above is, of course, necessary. What good, however, can come of disturbing the friable and tender wall of the abscess

or what better chance the patient has by the information so gained
by introducing the finger, one fails to see, ~~nor what is learnt~~ *but good*
~~thereby quite plain.~~ (79)

(11a) (b) When No Adhesions have taken place between the liver and the abdominal parities, or when such adhesions are unreliable, the

surface of the liver is to be stitched to the margins of the abdominal wound by a double row of sutures. The parts around may then be protected by packing with antiseptic gauze, and opened ~~im~~ immediately, or the wound is covered with an antiseptic dressing and the pus-cavity cut into a day or two later.

most what
There are various difficulties to contend with in this proceeding. In the first place, it is very difficult to get stitches to hold in an inflamed liver. The material is very friable at best, but much more so when it is inflamed, and on the point of breaking down before the advancing pus beneath. Moreover, if the pus is near the surface of the liver, which in nine cases out of ten it is, there is a great chance of the needle used in applying the suture penetrating the abscess-cavity and allowing the pus to escape.

(11b) (c) II In the Chest-wall.

~~When~~ When the aspirator-needle, inserted through the chest-wall, proclaims pus to be present, the steps ~~followed~~ *adopted* by some surgeons are as follows:—An incision of sufficient size—some ~~four~~ *4* inches in length—is made in the skin adjacent to the spot punctured by the needle. If it is evident ~~that~~ *at* the ribs encroach ~~on~~ *a* on the intercostal space, so as to interfere with the subsequent manipulations, ~~two~~ *2* inches ~~or~~ *h* or more of the obstructing rib must be excised. The diaphragm is then to be stitched to the (skin)

Margins of the wound, and a forceps thrust through the diaphragm and expanded. When a ^{by large} sufficient aperture is made in the diaphragm, ~~so as~~ to gain sight of the liver, the two are ~~to~~ stitched together. The ^Dabscess cavity is then opened *and a*

drainage-tube pushed into the cavity. When empty, suitable dress-

ings are applied ~~and the cavity allowed to contract~~. One point of great consequence in this operation is the danger run in open-

ing the pleura. When such an untoward event occurs, pneumothorax

will ensue, or pus will find its way in the pleural cavity.

To obviate such catastrophes it is necessary to ^{sew} ~~so~~ up the pleural wound before any farther step is taken.

About this operation the only remark to be made is, that when

the pus is absolutely bulging at an intercostal space, it is ~~no doubt~~

within the sphere of rational surgery; but with a deep-seated

abscess the sooner ^{an operation is held to be} ~~such directions are~~ obsolete the better.

~~for the patient, and the expediency of operation upon the liver~~

~~of the operator.~~ Dr Neil Macleod, of Shanghai, uses a metal drain-

age-tube which has some advantages; he condemns excision of

a part of a rib as unnecessary, and declares it inexpedient

to attempt to stitch the liver to the coverings.

The writer has ^{successfully} employed the plan ⁱⁿ of dealing with liver abscesses,

as shown him by Dr Manson, namely, by the Trocar and Cannula,

~~with success~~, and he has seen it used in the hands of others

with even better results, (see the cases of Drs Cowie and Inspe-

ctor-General Turnbull mentioned above.) The writer's method

differs from Dr Manson ^{that of} in being more simple and easy of ^{per}for-

mance, but in principle it is Dr Manson's plan he has followed

✓ with pronounced success. The question resolves itself into

this: If the patient is left until pus bulges ^{walls} ~~at~~ either the abdominal or intercostal ^{more than} ~~there~~ need be no hesitation of putting a knife into the abscess as in any other part of the body ;

but no practitioner is justified in allowing a liver abscess to reach that stage. Aspiration is not only ~~so~~ easily performed,

but is so directly beneficial to the inflamed liver, ^{so} that ~~there~~ need be no hesitation in even the first days of threatening

abscess ^{to} ~~so~~ act. When pus is found, say five inches from the

surface, more especially when the needle has entered by an inter-

costal space, then the ~~further draining of the cavity by a tube~~

^{by} ~~introduced through a Trocar and Cannula~~ is the only rational method

~~for~~ of treatment .

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MYCETOMA-MADURA FOOT--THE FUNGUS FOOT OF INDIA.) ^{8th Centur.}

The disease indicated by the above names is usually spoken of as "Madura Foot". Madura is a large city in Southern India in the district around which the disease is most prevalent.

~~In~~ ⁱⁿ several ~~parts~~ ^{parts} of India ~~is~~ ^{however} the disease, ~~met with~~ ^{also prevails}

^{more especially} in the district north from Bombay, between the valleys of the Indus and the Ganges, and ^{again} in Kashmere. ~~The disease is however~~ ^{If report be true, it is}

not confined to India, for ~~it is met with~~ ^{exists} in the French provinces ~~of~~ Indo-china. But even in Europe cases have been described,

which, according to the Italian observers, exactly resemble Madura foot. Nor are the continents of Africa and America exempt, for we have accounts of Mycetomatous disease from Algeria and from both North and South America. ^(For the pathology of this affection see vol I. Ch. VII)

~~Mycetoma is closely allied to actinomycosis, both in regard to its signs, and parasitic origin.~~ ^{Symptoms}

Symptoms and signs. ~~It is necessary to note that Mycetoma may occur in other parts of the body than the foot. It may be encountered in the hand, and in other parts therefore the term which refers it to the foot is a misnomer. The foot however is the part of the body most frequently attacked. When seen at the very earliest phase, the disease is seen as a small round firm and painless swelling on the sole. In a few weeks this tumour bursts, and from it flows a oily fluid charged with fish-rope looking bodies of a grey or yellow colour. This not however~~

always the case that the particles are either light in colour or roe
 like, ^{for} ~~but~~ the solid particles in the fluid may be black in app-
 earance and powdery in consistence. These varieties constitute the
 White and Black varieties of Mycetoma, around the differentiation
 of which a good deal of ~~an~~ discussion prevails. Some contending
 that the diseases are identical, ^{being} ~~others that they are but phases~~
~~of development or decay of one species. With the lapse of years~~
~~the foot increases in size, other fistulous openings~~
~~the foot increases in size, other fistulous openings and sinus~~
 develop, and the ~~connective~~ tissues form by continued inflama-
 tory process ^{become converted} into a thickened mass, of huge size, causing the
 elephantoid in bulk and foot to become an encumbrance. As the foot increases in size
 so does the limb above it waste, and the patient becomes less
 and less able to earn his livelihood. There is however no sudden
 development and as the internal organs are not affected, the
 general health remains fairly good, and it may be twenty or
 more years before the unfortunate sufferer is released by death.
The Parasite and its pathological surroundings. A mycetomatous
 foot, when deeply incised or bisected, shows the whole of the
 tissues to be involved in the disease, as with the exception of a
 remnant of bone here and there, and some of the more tough bits
 of tendon, nothing of the original structure is recognisable.
 Instead, the mass consists of a ^{cheesy} ~~soft~~ granulation looking tissue
 of a grey, or light yellow, colour. But the mass is although cheesy

to the cut, is not like a piece of close cheddar but resembles rather a piece of gruyere for it is honeycombed by ^{holes} ~~lees~~. These however are ^{always} not the isolated cavities met with in the food in question, but they ^{mostly} belong to, and are ramifications from a parent channel. The spaces may be minute or big enough to admit the thumb. All the recesses are filled by this oily fluid bearing the particles characteristic of the disease. When the masses of roe like appearance are submitted to microscope examination, they are seen to consist of a central ray like fungus similar to that of actinomycosis. ~~of the clubbed shaped process~~

There is the central mycelial reticulum, and intermediate zone of straight filaments, and an external zone of clubbed ~~terminal~~ ^{to the radiating filaments}. The fungus penetrates beyond the sinuses, and burrows its way onwards through the walls of the cavities to reach ^a new field of action. The difference between the white and the black varieties is very marked microscopically, and farther it is to be seen that although in the white variety the fungus is to be constantly met with, such is not the case in the black variety. Here a ray fungus is seldom or ever seen but instead an interlacing network of large undulating tubes of beaded appearance ^(clubbed ends) with a radiating arrangement. At present the belief is that the two varieties arise from a common fungus, the difference in colour and morbid anatomy being merely one of ^{of} developmental character.

in appearance

TREATMENT. Unfortunately no specific treatment is known. No medical treatment ^{arrests} ~~stays~~ the progress of the disease, nor does any local application seem to kill the fungus or even to stay its advances. Amputation is the only means of getting rid of the affection. This the native of India hesitates to submit to, ^{in the early stage} and ^{before relief is sought} it is usual to see the disease far advanced, ~~and~~ It is only when the patient's neighbours object to him on account of the foully smelling foot that he entertains ^{the} ~~the~~ idea of having the part removed. The Amputation should be performed at a considerable distance on the proximal side of the disease, as the bones, more especially, are liable to be infiltrated by the fungus for some distance beyond the swollen mass. ~~Recurrence is~~ ^{Recurrence is} certain, if the limb is not removed at a spot where the tissues are healthy, ~~and beyond the region of~~

Lecture on Prop
Surgery