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LIFE.

By PRESTON KING, M.D. Cantab.

THIS short word of four letters which I have taken for the title of my paper this evening, stands for the greatest mystery that we are met with in a world where everything is mysterious. It is a subject I know which might be considered hardly suitable to bring before a Clinical Society; but I make no apology for this, since we are scientists as well as doctors, and I think it is good for us at times to leave the more beaten paths, and wandering farther afield, to consider larger and wider problems. This particular subject, moreover, about what life really is, and how it began must, I am sure, by its very mystery, be of interest to us all. Far back into the distant past, and onward to the present day, man has ever tried to solve life's problems, and explain what it is that makes animate differ from inanimate nature. So far he has failed, but the time may come when these hidden secrets of nature will be unfolded.

In what I have to say I shall deal with some of the theories that are held by scientific writers upon the origin of life; touching lightly upon the vexed question of spontaneous generation. I shall then suggest the probable conditions under which life first appeared upon the earth; and finally in summing up I shall try to show that it is at least probable that life is still being started afresh. I shall be quoting from the writings of various authorities; especially those of Professor Loeb, Professor J. A. Thomson, Dr. Bastian, Professor F. J. Allen, G. Bunge (a German), Professor Lloyd Morgan, and Sir Robert Ball, and if, in the end, you find that this paper, in the words of a criticism I once read, contains some borrowed wit, and much native folly, I shall not complain. How, then, did life first appear upon the earth? The books teach that "nothing but life can produce life." Perhaps they are right—for the early student they are doubtless right; he needs dogmatic teaching, but if this dogma is sound, how did life in this world start at all?

It has been suggested there never was a time when life was not; that it is in the sun to-day, and that the earth, an offspring of the sun, inherited its share when it was born. Pfluger, who wrote in 1875, apparently held this view, for he speaks of life having originated from fire. H. E. Richter, in 1865, suggested germs of life being thrown off from heavenly bodies, and some finding lodgment here; for him it was impossible to think of life beginning. Helmholtz and also Lord Kelvin, thought that the germs came to the earth in meteorites; but, as Prof. J. A.

Thomson says, it is difficult to conceive of anything like the protoplasm we know surviving transport in a meteorite through the intense cold of space and the intense heat when passing through our atmosphere. Other investigators believing that life did once start upon the earth in obedience to natural forces and causes, have directed their enquiries to the question of how it started. Dr. Bastian held that, not only had it started once, but that it still is starting fresh to-day. By his experiments he thought he had succeeded in giving life to matter. He produced what looked like a unicellular organism, with nucleus complete. It was indeed indistinguishable from an amoeba, but it was not alive. He speaks of certain low organisms which cannot be assigned to either the animal or the vegetable world—he called them "ephemeromorphs". From these other forms appeared, some of which were unmistakable members of the vegetable kingdom, while others were no less representatives of the animal world. With these small nondescript organisms he was probably much nearer the beginnings of life than with his artificially-made amoeba.

Professor F. J. Allen, in a very interesting pamphlet entitled What is Life, advances what he calls his "nitro-centre" theory. He looks upon nitrogen as the critical element in vital chemical reactions as it is in our high explosives, nitroglycerine, T. N. T., etc. He says,, however, that his theory "refers only to the physical and chemical phenomena of life, and, if it could be demonstrated as correct, it would still leave the cause of the phenomena unexplained." In another place, he says that "until we find very strong evidence to the contrary we ought to assume that the cause of life is inherent in the universe." "That life is the direct outcome of the properties of matter, energy, etc.," adding, "I say, etc., because I am not satisfied to consider matter and energy the only components of the universe." In another passage, he says: "If we could trace life to its simplest form we might, find no absolute distinction between life, and not life" He believes that "the transition from inert to living matter is now going on, and says that " by chance all existing life were wiped out, another cycle would begin." Mr. Butler Burke suggests original vital units, or bio-elements, that may have existed throughout the universe, and which, by interacting on carbon compounds, give rise to cellular life as we know it to-day. By acting on sterilised bouillon with radium salts, he obtained what he called "radiobes" which seemed to him to be on the border line between the animate and the inanimate. He did not claim, however, to have effected "spontaneous generation." He says indeed that "to expect to make a fullblown bacillus at the present day would not be less absurd than to try to manufacture a man." He postulates a potential vitality in matter. 'Matter," he says, is ultimately mind-stuff," and "atoms are nothing more than ideas."

Professor J.A. Thompson in his "System of Animate Nature," speaks of living creatures which lie just on the border line of microscopic visibility; and suggests that beyond these may be others smaller still. He says that what we can

call "living", may have evolved in Nature's laboratory from what we call "not-living," and adds that "this is the trend to which evolutionist thinking certainly attracts us." He is not prepared to say that abiogenesis may not have occurred in the past, or may not occur in the future, and adds that the dictum omne vivum e. vivo is a statement of empirical fact, and not a dogmatic closing of the question. M. Kuckuck, in 1907, in an essay on experimental biogenesis —I quote from Prof. Thomson's Bible of Nature—points out that "if we add barum chloride, or a salt of radium, or a salt of nuclein to a gelatin-peptone, glycerine sea-water mixture, we may get little corpuscles which feed, grow, segment, move, and in fact do most things except live" and Prof. Thomson adds that such experiments may help us to get on the track of Nature's synthesis.

I will mention but one more authority on this great question of the "origin of life"—namely, Prof. Lloyd Morgan. He says—and again I quote from The Bible of Nature, "that those who would single out from among the multitudinous differentiations of an evolving universe the genesis of protoplasm for a special intervention, would seem to do little honour to the divinity they profess to serve." In a recent lecture delivered here, he spoke of evolution as "mind using matter," and suggested one single driving power behind the whole universe.

The attempts to produce living organisms by artificial means, and so to prove the theory of spontaneous generation, have certainly failed; and it hardly seems likely that further attempts in this direction will succeed; though in the light of the modern achievements of science we must be prepared for anything that the future may have in store. But though artificial generation must for the present be dismissed, the general weight of opinion among the scientists I have quoted, is certainly in the direction of life at some period in the earth's history, been generated in the great laboratory of Nature, and that it appeared without any special intervention, or interference with natural forces, and without the conveyance hither, by meteorites or otherwise, of the seeds of life from elsewhere. Assuming then that this is so, and that life did begin, it seems very difficult to believe that, at some particular moment in the past, life appeared, never to appear again; and that all living organisms, animal and vegetable, are descended from that once-started life. It is more reasonable to suppose, as indeed some of the authorities I have quoted seem not unwilling to allow, that the operations of nature have continued, and are still continuing, their life-producing work.

Let us now consider what state the earth was in, and what was the condition of nature's laboratory in these very early days when the spirit was first moving upon the face of the deep, and life first began.

The earth then at first was sterile, as we understand life, for it had been born of the sun in great heat.

As the ages passed its day became longer from the sometime day of only four hours, of which Sir Robert Ball speaks, and it gradually cooled. The watery va-

pour that surrounded it was precipitated into the hollows of its surface, and the dry land stood out. I suggest that when the time was ripe for life to appear, the seas were still warm; and that the atmosphere, besides containing much watery vapour, and many elements in a gaseous state, was especially rich in carbonic acid; and I suggest that the first living organism to appear was of a low anaerobic form.

In this connection consider for a moment the circulation of carbon. The element is for the most part contained, in combination with calcium and magnesium, in the gigantic strata of the earth's crust. The heat to which these rocks had been exposed would have set free enormous quantities of CO^2. It is in this form that carbon appears in the cycle of life, and it is in this form that it is taken up by plants. Now, the coal deposits of the world were laid down millions of years after life appeared. The great tree ferns, and rank vegetation which formed the coal would thrive in an atmosphere of CO^2; and the very coal itself speaks of vast quantities of this gas decomposed, and of oxygen set free. Now, if the atmosphere was rich at that time, in carbonic acid, it was certainly far richer those millions of years earlier, before there was vegetation to decompose it; that is at the time when life first appeared upon the earth.

It is not unreasonable then I think to suggest that the earliest forms of life were anaerobic; and that later on, nature's driving forces being ever the same, other forms of life appeared suited to the altering conditions. If life had a beginning upon the earth, as we have assumed it had, it is fairly safe to say that it began in the waters of the ocean. The experiments of Mr. Butler Burke which I have mentioned, and the formation of the "radiobes" he obtained by the action of radium salts on sterilised broth; and also those of M. Kuckuck with a radium salt in a sea-water mixture, both point to the possibility of radio-activity being one of the factors in the production of life.

The discovery of radium marked a great epoch in the history of science, and many preconceived ideas had to be reconsidered; and it certainly offers a hopeful field for future enquiry into the hitherto secret ways of Nature.

It has been suggested that the sun's heat, and also that of the earth as well, is kept up and maintained by the presence of radium Anyway, radium being present in the sun, its emanations reach this earth with other rays from that great source of energy. I suggest it was these emanations, and possibly chemical rays from the ultra violet field of the spectrum, that, working with other natural forces influenced matter in the production of life, and are still influencing it. If this is so it must cause small surprise that attempts to produce life should fail in the chemist's laboratory, where the work is necessarily carried on under very artificial conditions. Upon the open seas, however, Nature works out her own synthesis in her own way, bringing all her subtle forces and influences to bear on her task; and it may be that vitamines, upon which much work is just now being done, will prove to be one of her steps in the

building up of life.

If, then, from this great laboratory, Nature turned out living organisms in the far-off past, there seems no reason why she should not be continuing to do so still. In connection with the question of radio-activity, it is interesting to notice in passing the extraordinary wealth of luminous organisms that the sea contains. In some cases, as Prof. Thomson tells us, the light is dependent on life, with its cellular metabolism, and goes out when the organism dies. In other cases contact with life is not required, for the light is present in a luminous secretion, "which can be dried and yet retain its capacity of giving forth light when it is put into water after several days, weeks, or months." In another organism, one of the tribe of fireflies, the light given off is able like X-rays, to affect a photographic plate through an opaque medium.

You must forgive me this slight digression for, however interesting, it has nothing directly to do with the origin of life.

I suggest that, though life as we know it had a beginning here on earth, potential life was always in the universe. I suggest that it was in the sun when the earth was born, that it was in the earth when this was slowly forming, and that it only waited for the proper moment to appear, and that its first appearance was in the form of an anaerobic organism suited to the environment. For a moment now consider the lowest form of life whose movements we can watch. G. Bunge, in his Physiological Chemistry, translated from the German by Dr. Wooldridge, tells us of an observer who watched two minute monads. "These tiny cells," he writes, "were without limiting membrane, devoid of nuclei, and apparently quite structureless. They each had their special form of food, and would take no other." In the words of the observer: "The behaviour of these monads in their search after food, and their method of absorbing it, is so remarkable that one can hardly avoid the conclusion that their acts were those of conscious beings." Then, again, in the amoeba, with its single cell and nucleus—here we have an organism higher up in evolution than the structureless mass of protoplasm. The amoeba seems, in its single cell, to combine sense organ, brain, and muscle. Professor Jennings watched one amoeba pursuing another for a long time, and finally catching and ingesting it; then the captured amoeba partly got away, and was taken again. It again escaped, but was pursued and recaptured once more and carried away. After five minutes it escaped again, this time successfully.

The hunter, and indeed the hunted too exhibited perception, purpose, and self-determined movement, which could not be accounted for by surface tension. Here, then, in a minute structureless mass of protoplasm, and in an amoeba, we see the workings of a mind.

What then is this "driving power" as Professor Lloyd Morgan calls it, that makes matter live, that gives to a little mass of protoplasm its power of selecting its special form of food, and that gives it and the amoeba attributes which we associate with conscious living beings? It is that they, and

we are too, living in the atmosphere of a master mind.

The answer is, we de not know. What do we know indeed of any thing, that we should wonder at our ignorance in this, nature's great crowning mystery, life. Newton has taught us the laws of gravity, anyway as they apply to what we can observe here, and in the heavens—but neither he, nor anyone else, has told us what gravity is, or why the apple fell to the ground. We know nothing of the origin of motion, of what electricity is, or of the essence of matter, though we now speak of the once ultimate atom as a group of electrons. We thought we knew what light was till Einstein suggested doubts. So, when we remember all this shall we wonder at our ignorance about life? When we think in the widest sense of movement, gravity, energy, electricity, crystallisation and of life, we are bound to agree with Professor Lloyd Morgan in his suggestion of a unity of forces in nature, and of one single driving power behind the whole universe. Just as potential crystallisation was present on the earth when the elements were in an incandescent state, so potential life was there as well.

Aristotle said, there is nothing in the end which was not also in its quality in the beginning, and Professor Thomson sums up the matter by saying: "Our philosophical position briefly is, that in the beginning there was the Logos."

GALL BLADDER DISEASE.

THE RELATION OF THE PATHOLOGY TO IMMEDIATE OPERATIVE RESULT.

RUSSELL S. FOWLER, M. D., F. A. C. S.

In looking over my records of operations for gall bladder disease I find 608 cases in which the pathology of the lesions encountered is sufficiently and definitely described.

According to lesion these cases are divided as follows:

	Total	Recovered	Died
Acute Cholecystitis	230	206	24*
Chronic Cholecystitis	331	330	1
Acute Cholecystitis and Acute Pancreatitis	6	4	2
Chronic Cholecystitis and Chronic Pancreatitis	30	30	0
Carcinoma of the Gall Bladder or Bile Ducts	26	15	11
Carcinoma of the Common Duct and Pancreas	8	5	3
Curiosities of the Gall Bladder, ab-sence of Gall Bladder	1	1	0
Intestinal Obstruction from Gall Stone	3	2	1
Syphilis of Gall Bladder	1	1	0
Choledochus Cyst	1	0	1
Ecchinococcus Disease of Gall Ducts	1	1	0
	608	565	43

The Cases in Which a Cholecystostomy Was Done and Those in Which a Cholecystectomy Was Done.

The operation of cholecystostomy was performed in seventeen cases of chronic cholecystitis with no deaths; in 121 cases of acute cholecystitis with 12 deaths. In this group were a number of perforations and diffuse peritonitis, a pathological condition which usually has a mortality of 33 per cent. Cholecystostomy with choledochotomy for chronic cholecystitis was performed five times with no deaths. Cholecystostomy with choledochotomy for acute cholecystitis was performed seven times with one death. These choledochotomies do not include choledochotomies in which the duct was opened for exploration only, but those in which definite pathology was established. In practically all cases of cholecystostomy and cholecystectomy which I have performed in recent years the common duct has either been opened or explored by a method which will be described later.

To summarize, of the cholecystostomies which have been done for acute or chronic cholecystitis, we find 150 cases with 13 deaths, including gangrene of the gall bladder and perforation.

Turning our attention to those cases in which a cholocystectomy was done, we find that for chronic cholecystitis there were 284 operations with one death, while for acute cholecystitis there were 91 operations with 6 deaths, including those with gangrene and perforation. In cholecystectomy with choledochotomy for chronic cholecystitis there were 25 cases with no deaths. In cholecystectomy with choledochotomy for acute cholecystitis there were 11 cases with 4 deaths.

Comparison of Cholecystostomy And Cholecystectomy as to Mortality Irrespective of the Lesion For Which the Operation Was Done.

Cholecystectomy was performed 411 times with 11 deaths. This series included 36 common duct drainage cases and a large number of cases in which the duct was opened and sutured.

Cholecystostomy was performed 150 times with 13 deaths. In this series are included 12 cases of drainage of the common duct and a few cases in which the duct was opened and explored, and the duct resutured.

In regard to the safety of cholecystostomy as compared with cholecystectomy, it is manifestly unfair to draw the conclusion from the above that cholecystectomy is the safer operation, for the reason that the pathological conditions present at the time of operation are usually much more severe, in my experience, in those cases in which a cholecystostomy is done. In other words, through the desperate general condition of the patient, through the extent of the peritonitis, through the intense inflammatory reaction in the neighborhood of the gall bladder, it has many times been advisable to do the slightest operation which could be done, namely a drainage, and this has been done many times without disturbing the surroundings at all, but simply aspirating the gall bladder as it presented and then

draining it without, in some instances, even attempting to remove the stones, so desperate has been the condition of the patient. On the other hand cholecystectomy has been done in those cases which presented a fair chance for not only immediate relief of the conditions present, but with the knowledge that complete removal allowed also a better final result. Yet even here the 6 deaths which occurred in acute cases as traced out with one exception, were due to gangrene and perforation with peritonitis. The exception was an acute gall bladder and may be put down as an operative death. This case was one of empyema of the gall bladder in a stout woman operated at the Methodist Episcopal Hospital. The operation was rather readily performed, but there was a more than usually intense inflammation about the cystic duct in which a stone was impacted. The duct was isolated and the usual exploration made without difficulty. The cystic artery was isolated and tied without immediate hemorrhage. The gall bladder was removed in the usual manner. This woman had a myocarditis as many cases of gall bladder disease have and which, as I have shown in a previous paper, is due in many instances to the gall bladder disease. The patient took a good anesthetic, did nicely for forty-eight hours at the end of which time there was a small sharp hemorrhage from the wound depths caused, I believe, by the loosening of the ligature of the cystic artery. This hemorrhage would not have been of itself sufficient to have caused death; in amount it was certainly not more than six or eight ounces, probably less than eight ounces. However, with this patient's weakened myocardium there ensued immediately after the hemorrhage a dilatation of the heart with death.

Comparison of the Operative Mortality in Acute Cholecystitis as Compared With Chronic Cholecystitis.

Of these cases of chronic cholecystitis there were 331 cases with one death; of the acute cases there were 230 cases with 24 deaths of which 12 were cases of gangrene and perforation. Again we cannot compare statistics of this kind. The question is one of the underlying pathology for which the operation is done. There are a certain number of cases which have reached the stage which cannot be saved by any method of operating. This is evidenced also by the fact that of the 48 cases (this does not include those cases in which drainage of the common duct was instituted in addition to cholecystostomy and cholecystectomy. There were five deaths.

In addition to the cases in which a cholecystectomy or a cholecytostomy was done there were 13 cases in which there were 17 secondary operations upon the common duct following a cholecystectomy or cholecystostomy, the secondary operation being necessary either through stricture (two cases), recurrent stone (9 cases) or persistent leakage (2 cases). Of these 17 operations three resulted fatally; two of these deaths were in long persistent sinus cases one was in a case in which the original operation had been done for empyema of the gall bladder and in which at the second operation

the empyema had again formed. The patient was an elderly gentleman and death occurred on the thirteenth day from general asthenia. Of the operations for stone, all stones removed were of the common duct type. None were stones which had escaped from the gall bladder. Those cases in which stone was found also showed marked evidence of choledochitis. I do not think any of them were cases of overlooked stone, but of recurrent stone. The ducts in all the stone cases were wide, easily explorable at each operation, with dilatation of ampulla of Vater, with stiff walls, that showed the infection was of long standing. The condition was favorable for the reformation of calculi. Whereas in many of the cases in which choledochotomy was performed in association with cholecystostomy and cholecystectomy as a primary operation there were found stones in the hepatic duct, in this particular series of secondary operations such was not the case at the primary operation. At the primary operation in these cases stones were present in the common duct only, so I do not think there were any liver stones which subsequently came down to the ducts, but rather they were stones which formed in the duct itself. There were of these recurrent stone cases two which had two secondary operations performed. These cases form a very considerable argument for the early removal of the gall bladder before the disease has progressed beyond the gall bladder itself. In old chronic cases with great thickening and dilatation of the common duct it is wise to open the duct before palpating it, otherwise a floating stone such as forms in the second portion of the duct may float up into one of the intrahepatic ducts and be overlooked. There may be cases in which stones have been overlooked in the common duct, but since in these old chronic cases conditions are ideal for stone formation and since stones have been found in the common duct at secondary operations after the most careful exploration, both as regards digital exploration and duct exploration and washing out of the ducts, it is fair to suppose that a certain number of these stones at least, are recurrent and not overlooked stones. Where one has been in the common duct three times in the same patient as I have and has found one stone at the first operation, three stones at the second and two at the third, all stones of a large size and at which a most careful exploration was done at each operation, it is not reasonable to suppose that such stones were overlooked stones. Nor were they stones which came down from the gall bladder having been overlooked there; they all were of the bilirubin type with but little cholestrin. They were of the typical irregular shape, friable in construction and not polished or facet ted. I have yet to add to my collection that rare variety of common duct stone, a small yellow facetted stone such as forms at times in the dilated intra-hepatic ducts, being of a similar type to the small yellow facetted stone in the gall bladder. Common duct stones are irregularly shaped, black, friable, contain little cholestrin, contain much bilirubin and calcium, are not polished or facetted. Nor do they show the nucleus of a typical

cholestrin stone. Such a stone found in the common duct after cholecystectomy may be of intrahepatic origin, or may be formed in the duct itself. In many of these choledochitis cases there is a variable amount of sand present in the duct. This, of course, is washed away at the operation. It is also quite logical to suppose that the same inflammation which has affected the ducts outside the liver has also affected those within the liver, and that small particles of this sand gradually coalescing in time form a recurrent stone. There is but one method of prevention and that is the removal of the gall bladder before the inflammation has proceeded beyond it.

Just as in appendicitis, so in gall bladder disease, there is a stage at which the disease is readily curable with only the low mortality of less than one per cent. which attaches to abdominal operations, this mortality being due to unforeseen complicatoins.

Acute Pancreatitis Associated with Gall Bladder Disease.

I have only six cases of acute pancreatitis with acute gall bladder disease in this series. In one, cholecystostomy and drainage of the head of the pancreas was done in two; cholecystectomy and drain age of the head of the pancreas; in three, cholecystectomy, drainage of the common duct and drainage of the head of the pancreas. Of the series two died, one on the second day and one on the fourth day, one being a cholecystectomy and one a cholecystostomy.

I have, of course, operated up on many more cases of acute pancreatitis but only in these six have I been able to demonstrate an acute inflammation of the gall bladder coincident with acute pancreatitis. In the treatment of acute pancreatitis associated with gall bladder disease, as the pancreatic complication is much more danger ous than the cholecystitis, the operative attack should first be made upon the pancreas. As a rule in severe cases simple incision and tamponade of the pancreas should be attempted. In moderately severe cases a cholecystostomy is indicated in addition to the incision and tamponade of the pancreas, removal of the gall bladder and drainage of the common bile duct being left for a possible secondary operation. If the condition of the patient is good, however, the operative procedure for the cure cure of the acute pancreatitis may be undertaken. The ideal method is first to expose the pancreas, liberally incise the area affected, tamponade and then perform a cholcystectomy and drainage of the common bile duct.

Chronic Pancreatitis Associated With Gall Bladder Disease.

In a large percentage of cases of chronic gall bladder disease, with or without common duct involvement, there exists a certain degree of pancreatitis. The number of cases which will be definitely called chronic pancreatitis will depend upon the operator. It is my own custom to class as chronic pancreatitis those cases only in which there is a very definite hardening of the pancreas with increase in the size of the lobules. In the present series there were 30 cases. The occurrence of chronic pancreatitis does not seem to increase the risk of the operation as none of the cases died.

The fact that so many cases develop pathological changes in the head of the pancreas as a result of the gall bladder disease proves an additional reason for early cholecystectomy before the disease has proceeded beyond the gall bladder. I believe there is a definite relationship between chronic pancreatitis and carcinoma of the head of the pancreas. There are several cases which I have operated upon, doing a cholecyst-duodenostomy supposing the hardness of the head of the pancreas was carcinoma, but the fact that these people have lived two or three years led me to revise my diagnosis and consider these cases chronic pancreatitis.

I believe that in cases of advanced pancreatitis with marked sclerotic changes in the head of the pancreas it is better surgery to do a cholecyst-duodenostomy or cholecyst-gastrostomy than a cholecystectomy.

Primary Carcinoma of the Gall Bladder and Bile Ducts.

Primary carcinoma of the gall bladder and bile ducts is not so rare as was formerly supposed.

In the review of 608 cases of gall bladder disease primary carcinoma of the gall bladder or bile ducts was found at operation 26 times of 4+per cent. Fifteen cases survived the operation, eleven died. In cases not operated upon cancer has been diagnosed in a larger number of cases but has not been proved.

Among these cases are not included cases of carcinoma of the pancreas in which the common duct also was involved. In 13 cases the operation consisted of exploration only; in six cases cholecystostomy was done and stones removed, as the gall bladder as well as the surrounding liver were so involved as not to allow of other operation. These were cases in which there was a breaking down of the gall bladder wall. In one case a cholecyst-duodenostomy was done. In 6 cases the disease was so limited to the gall bladder as to allow a cholecystectomy. Of these latter cases four survived the operation, one died of pneumonia on the fourth day and one of an intercurrent nephritis within a week.

I believe that the real percentage of carcinoma is very much higher than 4 per cent. We have here an additional and very potent reason for urging early cholecystectomy.

Carcinoma of the Pancreas Involving the Common Duct.

Here we consider only those cases which were associated with gall bladder disease. In the series investigated we find 8 cases of carcinoma of the head of the pancreas involving the common duct. Of these cases three died and five recovered. In one case the gall bladder was removed and part of the head of the pancreas; this case died. In two cases, cholecystgastrostomy was done, one of which died. In four cases cholecyst-duodenostomy was performed; one died of shock on the third day and three recovered. In one case cholecystostomy was performed with removal of stones, the condition of the patient not permitting further operative interference; the case recovered.

As to the choice of the palliative operations in this class of case wherever permissible cholecyst-

duodenostomy or cholecyst-gastrostomy should be performed. Such an operation relieves the patient from jaundice for a period, increases the nutrition and makes him much more comfortable until such time as the disease progresses far enough along the common duct to involve the base of the liver. The introduction of bile into the stomach from cholecyst-gastrostomy though in larger amounts than occurs physiologically, does not seem to cause ill effect, so that if the duodenum is fixed by the carcinoma and cholecyst- appears technically easier, it may be done.

Gall bladder disease is essentially a surgical disease and it is as important to operate early in gall bladder disease as it is in appendicitis because adhesions forming in the neighborhood of the pylorus and duodenum are more disabling than those about the caput coli; because gall bladder disease is the more often followed by cancer; because gall bladder disease is a common cause of chronic pancreatitis.

It is all important that the gall bladder be removed before the disease has advanced beyond the gall bladder. Once the common duct is involved the disease assumes the same chronic type that is present in the gall bladder. Duct stones are liable to recur.

Injury to the lining of the duct is a predisposing factor in the formation of stones. For this reason the utmost delicacy of technique must prevail in exploration of the duct. The technique which I employ is to explore the common duct, using the stump of the cystic duct as the point of entrance, and employing a slender silver probe bent at an obtuse angle one half inch from its blunt tip. Such a probe is readily passed through the stump of the cystic duct, along the common duct, through the papilla and into the duodenum without injury to the delicate duct lining. Its free passage alone does not rule out stone, but is supplemented with digital examination from without, the probe serving as a guide. Even the smallest stones are thus easily detected. The duct is made readliy palpable in its entirety, the relationship of adjoining glands is easly appreciable, and, moreover, the procedure can be routine in all cases without fear of injury. With a little care in manipulation, the common hepatic duct, and the right and left hepatic ducts may be explored, the probe being molded to conform to the parts. The large lead probes commonly seen with gall bladder instrument sets should only be used with much enlarged and diseased ducts and then with care.

Should it become necessary to open the common duct to remove a stone the incision should be clean cut and sufficiently large to allow of removal of the stone without the necessity of bruising the edge of the incision. No enlarged duct should be palpated before being probed as a stone in the second portion of the duct may be displaced and caused to float up and into one of the hepatic ducts where it may prove difficult or impossible of removal. If there has been no trauma to the papilla and drainage into the duodenum seems adequate the duct may be sutured without duct drain age.

In suturing the same principle of suturing layers in other re-

gions should be carried out. Fine sutures should bring the edge in apposition and the sutures should not penetrate the delicate duct lining.

Not only in attacking the com mon duct is the utmost care necessary—far more care, I believe, than is usual in other abdominal operations—but delicacy of manipulation is essential in the cholecystectomy itself. Careless rough operating will cause a certain number of bad end results. Anesthesia must be perfect, exposure adequate and a technique be employed which will minimize trauma.

We may fairly state, then, that a certain number of bad end results are due to operative trauma, avoidable or not. Avoidable trauma is due to imperfect technique, and the surgeon will know whether he has employed a proper anesthetist so that slight if any retraction or packing is necessary, and whether he has used the most exquisite care in handling the tissues. Unavoidable trauma is due to dense adhesions, and they in their turn are due to the duration, extent, and in relative virulency of the disease. This brings us to the real cause of bad end results, the extent and duration of the pathology present. It may be taken as true in ninety-nine out of one hundred cases that the more advanced the lesion the more difficult is the relief of symptoms. A return to normal in the case of the gall bladder is impossible. All we can hope to do is to remove it and remove it in such a manner as at least not to increase the disabling adhesions and their resulting intestinal atony.

Unfortunately many medical men do not seem to grasp the necessity for an early operation which in view of the pathology of the disease and its proved progressive nature, the surgeon feels he may logically request. On the contrary, many cases are sent to the surgeon when the disease has advanced to a stage where relief is possible but not complete cure. In this respect the history of appendicitis of a generation ago and of duodenal ulcer of a decade ago is being repeated. No one now thinks of any method of treatment for appendicitis other than operation, nor of treatment other than surgical for duodenal ulcer, once its chronicity is established. Yet gall bladder disease continues to be treated medically in spite of the fact of its chronic progressive nature and the well proven fact that such an infected focus is responsible for so many near and remote complications.

Typhoid and Paratyphoid Fevers.

BY ALEX. J. WILSON, F. R. C. S.Ed., D. P. H. Edin.

Mr. Chairman and Gentlemen,— I am afraid I cannot say anything original on this subject, but as I have read a good deal of the literature, and have had some experience of the enteric fevers both in the army and in the local fever hospital, I shall endeavour, at least, to give you a brief summary of their main features, laying emphasis on the points of practical importance. During my sojourn on the shores of the Mediterranean, in the early days of the war, I had an opportunity, although my duties were largely surgical, of comparing and contrasting a large number of soldiers suffering from typhoid and paratyphoid fevers. To me it was quite an interesting experience, because prior to 1915 I had never seen a case of paratyphoid to my knowledge, although paratyphoid B. has been recognised in Britain during the past ten years. It has been established that the bacilli of the typhoid subgroup are distinct specific microorganisms, and the diseases to which they give rise are known as typhoid fever, paratyphoid A., and paratyphoid B. The symptoms of the three diseases are very much alike, but paratyphoid is, as a rule, a milder disease. Fever due to the bacillus paratyphosus A. is the prevailing type of the disease in the East, and it is a milder disease than paratyphoid B., which is the form of paratyphoid usually encountered in the Western hemisphere. Before the recent war paratyphoid A. was very rare in Europe, and its introduction to France and Belgium was generally believed to be due to the presence of carriers amongst the troops.

Etiology.—Enteric fevers are caused by the bacillus typhosus (Eberth), B. paratyphosus A. (Schottmuller), B. paratyphosus B. (Schottmuller), and it is probable that there are several varieties of each of these germs. Of the bacillus typhosus, for instance, two varieties can be easily differentiated, one rendering milk alkaline after an initial acidity, the other making milk permanently acid. The infection may readily be conveyed by means of water causing serious epidemics, but more frequently the bacillus is conveyed from the stool or urine of an infected person, either through the agency of flies or directly to food from a carrier of the disease. With regard to the bacillus typhosus, it is found in the intestine not merely during the attack of fever, but during the incubation, and for a period extending perhaps as long as thirty years after an attack; that is to say, the bacillus has been grown from the faeces of a person thirty years after an attack of enteric fever. As to the habitat of the bacilli while in the carrier, it seems that the gall-bladder is of the greatest importance, while during the actual attack of fever the bacilli are to be found not merely in the intestinal contents, but also in the mesenteric glands, the spleen and circulating blood. The proportion of female carriers to male carriers is five to one, which is probably due to the fact that women are more liable than men to affections of the gall-bladder.

Symptoms.—After an incubation period varying from eight to sixteen days (usually ten to twelve) a typhoid patient complains of headache and general malaise with perhaps slight shivering and epistaxis. The onset, as you all know, is usually gradual; the abdomen is usually tumid and often tender on pressure, especially in the right iliac fossa. Abdominal pain is sometimes complained of, and the tongue becomes furred on the dorsum and red at the tip and edges. There may be constipation or diarrhoea with typical ochre stools, the pulse is comparatively slow and of low tension, and the temperature chart shows the well-known staircase arrangement (The bacilli can be cultivated from the blood from the first until the tenth day.) During the second week the high continued fever is usually quite characteristic, and there is a decided increase in the severity of the disease, as shown by the growing apathy and dullness of the patient, the aggravation of the symptoms, with the exception of headache, which tends to abate towards the end of the first week as a rule. The enlargement of the spleen and the typical spots may be seen early in the second week and sometime towards the end of the first week. The tendency to haemorrhage is now more marked, and the danger of perforation of the bowels has to be kept in view. The Widal reaction is now obtainable, as well as the diazo-reaction in the urine, while the specific bacilli are much more difficult to obtain from the circulating blood, but can still be recovered from the spleen, the faeces, the rose spots, and often from the urine.

During the third week the temperature may gradually fall to normal about the twenty-first day in a mild case, and with this the various symptoms subside and convalescence begins, but the severe symptoms may continue and become aggravated, and the patient passes into a condition commonly called the "typhoid state." The pulse becomes more rapid and dicrotic, with marked nervous symptoms, emaciation, and anaemia, and there is a great danger of haemorrhage and perforation of the intestine or some other complication.

Symptoms of Paratyphoid

In my own series of cases I got a history of sudden onset, as a rule, and I was particularly impressed with the profuse eruption of large rose-coloured spots all over the body, often making their appearance when the other symptoms were subsiding. The rash in many cases was quite different, both in the size and number of the spots from any case of typhoid fever I have seen, either at home or abroad.

In an ordinary case of typhoid fever one has to hunt for the small rose-coloured spots as a rule, and, as often as not, unsuccessfully, and when we do find half a dozen or thereby we treasure them, and put rings around them as if they were curiosities, but in a typical case of paratyphoid, at least, in my experience, the extensive eruption of large, more or less, lenticular rose-coloured spots meets the eye at once.

The symptoms of paratyphoid are on the average both milder and of shorter duration, although severe and fatal cases are not rare. Headache and pains in the back,

and often high fever occur, although the course of the temperature is usually shorter (about a fortnight), and more of a remittent or even intermittent type than in cases due to the bacillus typhosus, but mild cases of the latter infection are quite indistinguishable from paratyphoid clinically, as are the varieties of the latter from one another, so only cultivation of the different bacilli from the blood, faeces, or urine will enable the diagnosis to be established with certainty.

In the early days of the war T.V. was used for innoculation but later the T.A.B. vaccine was introduced, and it became increasingly difficult to make a clinical diagnosis. The clinical picture has been so much modified since the protective inoculation against enteric fevers has been so completely carried out that it is practically impossible on clinical grounds, alone to discriminate as to whether an inoculated patient is suffering from typhoid, paratyphoid A. or B.

The varieties of typhoid may be classified as ambulatory, abortive, mild, typical, severe, and masked. The masked type of fever is that in which one special group of symptoms is pronounced, as, for example, the nervous, with the severe headaches, neuralgias, early delirium, and other marked mental symptoms, e.g., mania or the signs of menginitis. Another example is that in which the pulmonary symptoms are specially marked, sometimes called pneumoenteric.

Complications and sequelae.—Pneumonia is the commonest complication in my experience, and it may be broncho, lobar, or hypostatic. One of my military patients, a man from this neighborhood, developed pneumonia followed by empyema. He was so ill that I hesitated to operate, but he made an uninterrupted recovery and shortly afterwards he was shipped to the Western front, where, sad to relate, his troubles were ended by means of a German bullet.

More or less hemmorhage is fairly common, but I have seen very few cases of perforation. Some years ago I operated on a case of perforation, but the perforation was not found in the bowel, and the post-mortem examination revealed the presence of a small ulcer on the floor of the gall-bladder about the size of a threepenny piece with a pin-hole perforation.

Deafness.—I have noticed this complication frequently, both in a military hospital and the local fever hospital, but it is usually of a temporary character. Insomnia is not uncommon, but I have met with somnolence oftener than insomnia. Some patients are very drowsy and may be said to sleep through their entire illness, and, as a rule, drowsiness is a favourable sign. All other complications, including phlebitis, thrombosis, and embolism, periostitis, cholecystitis, otitis, &c., are common to both tropical and temperate climates, but the most important complication in tropical climates is malaria.

One of the most important sequels to an attack of enteric fever, as you know, is the relapse which may occur at any time during the three or four weeks following the fall of temperature, and in several out of my cases two distinct relapses occurred.

Diagnosis: (a) Clinical.—The diagnosis of enteric fever in typical cases is not difficult. Headache, with epistaxis, the slow onset of the fever, the apathetic appearance of the patient are all suggestive, and should lead one to examine the spleen for enlargement, and appeal to the bacteriologist for confirmation. A patient with a continued fever of a week's duration, who has no local symptoms to account for the fever, is probably suffering from enteric fever or tuberculosis, and the Widal test will, as a rule, settle the diagnosis. It is the atypical varieties of enteric that are puzzling, and one has to keep specially in mind influenza, gastro-enteritis, typhus, tuberculosis in its various forms, pneumonia, ulcerative endocarditis, and in tropical climates malaria and other tropical diseases.

The diagnosis in civil life is sometimes difficult enough, but when one has a shipload of sick men dumped down with all sorts of labels round their necks, including dysentery, malaria, typhoid, paratyphoid, influenza, diarrhoea, &c., and a large percentage of them labelled P.U.O. and N.Y.D., it is a very different matter, and the task of getting them transferred from the docks to the hospital, and getting them into their respective wards to begin with, would tax the resources of the most expert at lightning diagnosis. Under the circumstances it took several days to get them sorted out, and to arrive at a diagnosis even approximately correct.

There is no pathognomonic clinical feature in paratyphoid fevers, either to distinguish paratyphoid fever A. from paratyphoid fever B., or to distinguish between paratyphoid fevers and typhoid fever properly so-called. Paratyphoid fever may present all the symptoms and all the complications of typhoid fever, but, according to Vincent and Muratet, one may be guided in the diagnosis of paratyphoid, though not constantly, by certain signs, amongst which the following are the most frequently observed:—

1. The suddenness of the onset with vomiting and shivering.
2. The frequency of pain in the occiput at the onset.
3. The early eruption of labial, facial, or buccal herpes.
4. An ill-marked typhoid state.
5. A fairly frequent meningeal reaction.
6. Slight degree of diarrhoea; constipation the rule.
7. Frequency and intensity of perspiration at the onset or in the course of the disease.
8. The sometimes remarkable, though not invariable, abundance of lenticular rose spots, which may appear at the onset of defervescence and last for some days later.
9. The frequent and considerable enlargement of the liver.
10. Shorter course of the disease.

In my own series of cases of paratyphoid fever I was particularly impressed with the profuse eruption of large rose-coloured spots, and with the almost entire absence of what is known as the typhoid state, indeed, the absence of the "felled" appearance so common in typhoid fever was very remarkable.

Malta fever has to be excluded as it frequently starts like typhoid fever and may be mistaken for it at the onset. I saw several cases

of Malta fever which had been imported from Malta. This disease has disappeared from Gibralter since the importation of goats from Malta has been stopped.

Pyoemia, septicoemia, and puerperal fever sometimes present a collection of symptoms which may suggest typhoid fever, such as prolonged pyrexia, distension of the abdomen, diarrhoea, and typhoid state. I remember attending a woman during her confinement some years ago, and a few days after the birth her temperature rose and she developed symptoms highly suggestive of puerperal septicaemia, but the colour of the stools induced me to send a specimen of the blood for examination, which gave a positive Widal.

(b) The bacteriogical diagnosis —The principal methods of bacteriological diagnosis are (1) the agglutination test, and (2) haemocultures.

(1) **Agglutination test** (Widal reaction).—This test was formerly our sheet anchor in doubtful cases, but the following points have to be borne in mind:—(a) The reaction is usually absent during the first week. (b) In some rare cases the test may remain negative throughout the whole course of the disease. This was the case in several fatal cases under my care, and it is usually in cases of a malignant type that this phenomenon is met with. (c) The reaction with the B. typhosos is negative in paratyphoid A. and paratyphoid B. (d) When the reaction is positive it should be remembered that the blood may contain specific agglutinins many years after the patient has recovered from an attack of typhoid fever. (e) The reaction is positive in vaccinated persons for a variable period of time after inoculation.

Since the introduction of the triple inoculation vaccine agglutination has become a much more elaborate and delicate process requiring an experienced bacteriologist to interpret the results. The generally accepted method and one which has been the most successful is that known as the Dreyer method.

(2) **Blood cultures.**—Two methods may be used—the so-called dilution method, introduced by Castellani in 1893, and the bile enrichment method introduced by Drigalski and Conradi. Where a laboratory is available an early and certain test of the presence of typhoid fever may be easily carried out by taking several cubic centimetres of blood from a vein and diluting it with several hundred cubic centimetres of sterile broth. In this way the typhoid bacillus may be obtained in pure culture in a large proportion; for out of 604 cases, collected by Coleman and Buxton in New York, in 75 per cent. positive results were obtained. During the first week of the disease the typhoid bacillus was cultivated in 93 per cent, in the second week in 76 per cent, in the third week in 66 per cent, and in the fourth week in 32 per cent. The great advantage of this test is that positive results are said to be obtainable as early as the second day of the fever. Up to the seventh day positive results are usually obtained, but after the tenth day blood cultures are only occasionally successful, but by this time the serum test will be available. In inoculated subjects, in whom the Widal test is less simple

blood culture is by far the most reliable diagnostic method when the patient is seen early enough; while later, cultures from the stools or urine may be successful in isolating the causative bacillus, whether that of true typhoid or paratyphoid.

Macroscopic Method.—This is the sedimentation test often used in the absence of laboratory facilities in the tropics, also used in France during the war, and found to be very valuable if carried out with care.

Antropine test.—Marris's atropine test has this advantage that it is not affected by previous vaccination. Marris has published detailed results of his use of atropine in the diagnosis of enteric group infections. The rationale of this method is based upon the fact that atropine paralyses the vagus terminals, thus causing the pulse-rate to be rapidly increased, whilst in the normally slow pulse of typhoid fever no material increase in the pulse-rate occurs.

Prophylaxis.—The two chief prophylactic measures are undoubtedly inoculation and the elimination of carriers.

Protective inoculation.—The late Sir Wm. Osler was credited with the saying that in warfare the bacillus killed more than the bullet, and in former wars this was certainly true with regard to the typhoid bacillus. In the South African War no less than 57,684 cases of enteric occurred in an army of 557,653 of British officers and men, with 8,225 deaths, or a case-mortality of 14 per cent. The method of protective inoculation introduced and elaborated by Sir Almroth Wright, with the result that over 97 per cent. of our men in the recent war were inoculated, has entirely altered the character, and has undoubtedly proved an important item in the prevention of the enteric fevers. During the recent war no more than 7,423 cases occurred in the British army in France with a mortality of 3.58 per cent. This result was, no doubt, largely due to protective inoculation, although as Colonel Harper says, there were other very important factors at work, viz., the exceptionally capable sanitary administration, the great care taken in the feeding and comfort of the men, the elaborate arrangements for bacteriological investigation, the prompt recognition by the regimental medical officers of the cases of suspect enteric, and the wisdom of the course adopted early in the war of selecting special hospitals for the investigation and treatment of this disease.

The following figures appearing in the Lancet recently give very striking testimony to the value of protective inoculation:— Total cases of typhoid and paratyphoid in British armies in France from the commencement of operations to the 31st December, 1918 (British troops only.)

97 per cent. of strength inoculated

	Cases	Dths	(per cent.) Mort'y.
Inoculated with T. V. or T.A.B., ..	1728	79	4.57
Uninoculated, .. .	703	129	18.35
Total	2,431	208	8.55
Paratyphoid —			
Inoculated with T.A.B, ...	1,357	17	1.25
Uninoculated, .. .	2,694	35	1.29
Total	4,051	52	1.28

Enteric group—			
Inoculated with T. V.			
or T. A. B., ...	878	4	0.45
Uninoculated, . ..	63	2	3.17
Total	941	6	0.63
Grand total ...	7,423	266	3.58

Comment on this table is almost unnecessary. The mortality amongst the inoculated typhoids is particularly noteworthy. The paratyphoids are included under one group. The term "enteric group" is a useful method of classifying those cases where the agglutination results, whilst pointing to enteric group infection, do not suggest with sufficient definition the variety of the infection.

It is only when one considers not only the low mortality-rate but the low morbidity-rate, and the conversion of a dangerous illness into what might be called a slight ailment in hundreds and thousands of cases, that one realises what a tremendous boon protective inoculation has become. The rarity of cross infection was astounding as well as gratifying, and this was specially noticeable where men were packed together in transports en route to hospital from the Eastern theatre of war.

Elimination of carriers.— The discovery and treatment and removal from dangerous positions of these carriers constitute a most important part of the prophylaxis against the disease, and one thing is certain, viz., that they should be rigidly excluded from employment in connection with the preparation of human food.

Treatment.—In mild cases no special treatment is advisable or necessary. Fresh milk, if available is the safest food, but during the war, we had often to be content with tinned milk, which served the purpose very well. The milk should be citrated or diluted with lime water, and attention should be paid as to whether it is properly digested or not by examining the faeces. If it is not digested it should be replaced by malted milk or peptonised milk or whey. Weak tea, chicken tea, and meat extracts can be given in most cases. Beef tea and hough soup are very useful in the absence of diarrhoea.

For many years we have carried out the treatment recommended by Dr. Claude Ker, in our local fever hospital, which consists in giving 3-grain doses of calomel every second night. This prevents stagnation of fermenting material in the ileum, and also has a decided antiseptic effect. This drug has been proved to limit the multiplication of the organisms of putrefaction in the gut. The objectionable matter having been removed from the ileum, it is not allowed to remain and irritate the large intestine, but is at once washed away. To obtain the full effect and to prevent colic or pain, an enema or irrigation must always be administered six or seven hours after the dose.

Special Symptoms may require treatment, especially in civil life among patients who have not been inoculated.

Tympanitis should be treated by fomentations and turpentine enemata; constipation by simple enemata every second day; hoemorrhages by turpentine, internally, and sips of cold water.

A hypodermic of morphia is very useful, also calcium lactate given internally in 10-grain doses.

Perforation.—The only treat-

ment likely to be successful in laparotomy performed as soon as possible.

Excessive diarrhea may be treated by small doses of opium combined with kino and catechu. Starch enemata and laudanum are valuable. The milk should be boiled and well diluted with lime water. I have found mist. bismuth pepsin co. very useful, but the objection to bismuth is that it obscures traces of blood which may give valuable hints of a possible haemorrhage.

Cholecystitis.—This should be treated by urotropine, and when chronic by anti-typhoid inoculation, and, of course, surgical treatment may be necessary.

Hyperpyrexia may be treated by tepid, cool, or even iced sponging, or by immersion in baths of a temperature between 75 to 85 degrees F.

Delirium.--Sedatives are required and lumbar puncture has been performed to relieve intracranial pressure. A hypodermic injection of morph. gr.¼, taropine 1-120, and hyoscine 1-100 is most useful in cases of violent delirium. Many other complications may arise which require treatment, especially pneumonia, failing heart, phlebitis, &c., and an important point is the treatment during convalescence of the acute carrier.

The acute carrier should be treated by anti-typhoid inoculation, and urotropine should be administered, for this drug in addition to its action on the kidney is excreted during twenty-four hours by the liver cells and by those of the gall bladder. According to Castellani a dose of fifteen grains per day is sufficient to destroy the bacillus typhosus in a gall-bladder in ten days, but experience proves that the complete cure of carriers is usually a difficult matter.

Vaccine treatment has been extensively tried as routine treatment for the enteric fevers with such varying results, however, that the method cannot be said to be yet established on a sure footing.

Modern Building For Doctors Only

Toronto—Something new in the way of a modern office building for use of medical men is promised by Mr. H. Addison Johnston. He will erect this building on property at the corner of Bellair avenue and Bloor street west.

Mr. Johnston has just returned from a trip to some of the large U. S. Cities, where the plans of similar buildings have been carefully considered. The proposed building will be a few steps in advance over anything now in use. Doctors will be given every modern facility for the carrying on of their profession, including twenty-four-hour telephone and elevator service. The building will be equiped with sterilized hot water, ice water, compressed air, and each doctor's office will contain a separate wash room, fully equipped. The building will be modelled somewhat after the style of that on 41st Street, New York, which is now occupied by about one hundred and fifty physicians and surgeons.

The Publisher's Page.

It is the privilege of the LANCET PUBLISHING COMPANY to have associated with them in the production of the CANADA LANCET the following well known physicians:

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WITH THE PUBLISHERS

Due to a strike of all the printing trades in Toronto, we were unable to publish the CANADA LANCET for June. July issue was produced under difficulties, but August sees our regular schedule resumed. We anticipate no further delays due to this cause.

Every subscriber to the CANADA LANCET will be dated one month ahead to make up for the missing June issue.

We will appreciate criticisms of the CANADA LANCET from every source. What the doctors of Canada want, the CANADA LANCET will become. It is their paper and we want them to feel the columns are open for a free discussion of all topics.

THE CANADA LANCET will be sent only to paid-in-advance subscribers. We wish to point out, however, that until we receive notice of discontinuance we are forced to consider that you wish the CANADA LANCET continued and that you will honour your account when presented.

Value for value received is the policy of the CANADA LANCET in the future.

The Lancet Publishing Company
163 CHURCH ST., TORONTO

Review of Happenings in the Medical World.

The Vitamines in Therapeutics.

Why should a physician prescribe vitamine preparations if all the known vitamines can be found in natural food? Why not simply direct the patient as to the kinds of food to eat? These questions naturally suggest themselves to thoughtful medical men at a time when so much is written on the subject of vitamine deficiency.

In favor of using the extracted vitamines there seems to be scientific evidence that is bound to command our respect. Take, for example, the work of Eddy. This keen observer found that, even though the diet of the child contained an appreciable amount of vitamine B. there was a marked stimulation of growth when three per cent of a vitamine extract was added to the food. He explained this on the basis that an extracted vitamine is more readily available than that which is contained normally in food.

Besides, it is easily conceivable that the ingestion of the requisite quantity of any one of the vitamines as found in its natural state would entail the performance of gastronomic feats that would be far from salutary.

Altogether it does seem that a preparation of extracted vitamines, such as is offered by Parke, Davis & Company under the name of Metagen, fills an important therapeutic niche. Metagen has been subjected to carefully conducted clinical investigation and is physiologically standardized for the presence and activity of all three of the vitamines.

A Method of Preventing The Absorption of Intestinal Toxins

"Keep the colon toxins from being absorbed by the body," is the urgent appeal of the modern authority. This is almost tantamount to saying: 'Keep the mucous membrane of the colon intact," for it is through abrasions in this membrane, hindering the outflow of mucous into the colon, that the absorption of toxins from the fecal matter takes place.

To overcome such a condition, Nujol is freely used by the profession. It retards the absorption of poisons by preventing their contact with the living tissues. It also exerts a lubricating power, softening the stools to permit easy and frequent evacuation. In addition to this, an important function of Nujol is the absorption of toxins, retaining them in the fecal mass until expelled.

Nujol is readily accepted by the most "finicky" patient, because it is absolutely tasteless, odorless and of a crystal clearness.

May Pay Doctors to Inject Serum

The Ontario Department of Health is now taking under consideration a plan for the payment of physicians who administer syphilis treatment under the direction of the Provincial Board of Health in the smaller municipalities where it is impracticable to establish clinics as is being done in the cities. The scheme, for which legislative provision was made last session, is in a tentative stage but doctors who treat

patients will, if the plan it adopted have the drug phenarsenamine (606) supplied to them by the province free of cost, in addition to receiving a small sum for their services.

The work of driving our venereal disease through clinics in the larger centres is proceeding apace. There are now thirteen of these clinics, six in the six Toronto hospitals and one each in Brantford, London, Windsor, Ottawa, Fort William, Owen Sound and Kingston. All are in hospitals with the exception of that at Windsor, which is conducted by the Local Board of Health. The drug is furnished free of cost to these clinics, and the treatment is free. In the past eleven months some 15,000 tubes of the drug have been distributed. Generally speaking, the drug is supplied only to clinics and public institutions but doctors who have patients unable to pay are also supplied free after the Department is satisfied that the doctor knows how to administer the drug. Where there is any doubt an expert in the employ of the Department is sent out to instruct the local man how to handle it.

J. H. Kahler, of Rochester, Minn., enjoys distinction, as head of the Kahler Corporation, of proprietorship of one of the world's most unique hotels. The Kahler will open September 1st with a capacity of 600 guest rooms, in a town of about 5,000 resident population. In addition, the Kahler people operate in the same small-town community, the Zumbo, Cook and Damon Hotels, offering a combined capacity of over 1,000 rooms. But for the Mayo clinic Rochester would rate from 4,000 to 5,000 in population, the floating population being estimated at 4,000 per day, and two-thirds of the resident families "taking in boarders." As for the new Kahler, the four upper floors have been built and furnished as roof garden, promenade and convalescent rooming floors, patients in various stages of health recovery passing downward until again in the environment of a modern city hotel. They have the advantages of special diet kitchens, trained nursing staff, invalid service, etc., the plan being to graduate their return from hospital to home life almost imperceptibly. The first hotel embodying these new principles has been taken over by the town as the Colonial General Hospital.

U. S. Doctors Address Medical Association

North Bay,—The annual meeting of District No. 9 of the Ontario Medical Association was held on board the steamer Armour, on the Magnetawan River, which district is the summer home of many of the most notable of the medical profession of Canada and the United States. The members of the association, who were met at Burk's Falls, were taken to Magnetewan, where they were entertained by Dr. J. T. and Mrs. Freeborn.

The convention proper was held on the ship, with Dr. E. Brandon of North Bay presiding. Papers were read by Dr. W. E. Gallie of Toronto, Dr. Howard Kelly of Johns Hopkins University, Dr. Charles Sommers of Baltimore University, Dr. C. W. Parfit of Gravenhurst Sanitarium, Chancellor Kirkland of Vanderbilt Univer-

sity (Nashville), Abraham Flexner, LL. D., of the General Education Board of the United States, and Dr. Thomas Cullen. Dr. Lillian South, Chief Bacteriologist of the State of Kentucky, gave an address on the Vital Need of Sanitariums in Small Towns and Country Districts.

The convention was entertained during the afternoon at Wildwood, the summer home of Dr. and Mrs. Barber. The evening session resolved itself into a round-table conference, at which the following were the speakers: Dr. F. J. Farley of the Ontario Medical Association, Trenton; Dr. T. C. Routley, General Secretary of the Medical Association; Dr. E. R. Secord Brantford, and Dr. J. H. Mullin, Hamilton.

See Living Germs With Microscope.

By Forbes W. Fairbairn.

London,— Britain's scientific world has been thrilled by the discovery by J. E. Barnard of how to apply the ultra-violet and other rays to microscopic examination of living germs in such a way as to enable them to be examined in detail on a hitherto unknown scale.

In the course of his researches Mr. Barnard has been able to photograph the living bacillus and reveal its finer structure. Where formerly microscopy gave a useful magnification of 1,000 diameters (or magnified an object a million times) beyond that point it started to break up light itself. It gave a bigger image, but no more details.

With violet rays, ultra-violet rays and "soft X-Ray," Mr. Barnard has succeeded in getting a useful magnification of 3,500 diameters, which is equal to magnifying an object twelve and one half million times. He shows the bacillus not as a dyed and shrivelled corpse but as a living object twelve times larger than the best of the old microscopes, and reveals its structure. He can obtain a photograph in ninety seconds.

"Mr. Barnard uses a miscroscope equipped throughout with crystal lenses," explained Dr. J. H. W. Eyre President of the Royal Microscopic Society. 'These permit the free passage of all ultra-violet rays. Mr. Barnard is now passing from examination of bacteria by photography to the direct visual examination of sections and tissues, an ever more difficult and dangerous work.

"A most interesting development of Mr. Barnard's work is likely to arise from his discovery that tissues under violet rays exhibit variations in fluorescence or coloration. This may be due to essential differences in cell protoplasm or to deposits of salts in the tissue. We know that certain conditions, such as atheroma and arterio-sclerosis are due to the presence of salts. If we can determine the presence of these salts at an early stage by the Barnard method we may make a great advance in the cure or prevention of such diseases.

"In connection with the study of bacteria, Mr. Barnard's work should produce important results. It is interesting to note that his photographs appear to show the structure of bacteria. It is too soon to state definitely that the lines which appear actually correspond

to internal structures; they may be due to wrinkles in the outer casing of the bacteria; but I am inclined to think that they do actually show us how the bacteria are constructed. In that event we may be able to make considerable progress toward the preparation of more efficient vaccines and serums.

"The future of medicine seems to be in this direction. I do not wish to state positively, but I am inclined to believe that all medical treatment of infective diseases will in the future be along these lines, the use of vaccines and serums for their prevention and cure Drugs will then be used for the alleviation of symptoms only."

May Charge Not More Than $1,000 for Operation

Baltimore—The Board of Trustees of the John Hopkins Hospital yesterday issued the following dictum:

"The maximum fee that any surgeon ought to charge for an opreation no matter haw wealthy the patient may be, is 1,000.

"The maximum charge that any physician ought to make for attending patients in any hospital is $35 a week."

The dictum takes on the force of an order to physicians and surgeons practising in the hospital, limiting fees to be charged.

New Pathologist at St. Michael's.

The staff of St. Michael's Hospital has recently received a notable accession in the person of Dr. W. Magner, who has accepted the position of Director of the Pathological Department, and will devote his entire time to the duties of that office and the concurrent post which he is to occupy in the Pathological Department of the University of Toronto.

Dr. Magner pursued his medical studies in Cork, where his father has for many years been a medical practitioner. He holds the degrees of Doctor of Medicine, Bachelor of Surgery and Bachelor of Obstetrics from the National University of Ireland, of which he is also a Diplomate in Public Health. His undergraduate career was so completely successful that, on qualifying as a medical man, he was appointed by Sir Bertram Windle, then President of the College, to a position in its Pathological Department.

When the war broke out, Dr. Magner obtained leave from the college and joined the R.A.M.C. He was severely wounded at Suvla Bay and, when sufficiently recovered, was sent to Alexandria to serve in the central Bacterialogical Laboratory there. After his period of service there, he returned to take up the post, which he had held before the war, of Lecturer on Pathology in University College, Cork, having been also appointed Bacteriological Expert to the Cork Barracks. These positions he has, of course, vacated to take up the office which he now holds in Toronto.

BOOK REVIEWS.

Surgery;—By Francis A. Stewart, M.D., Surgeon to the Pennsylvania Hospital; Published by P. Blaikiston & Co., Philadelphia.

Conciseness and completeness are two ideals every author has in mind when writing a book but not every one achieves that end.

In "Surgery" we find a useful combination of a text book for the undergraduate and a useful guide for the Medical Practitioner who seeks a guide to present day surgery. The chief desire; therefore, has been to set down the facts the student must know and to make such suggestions in diagnosis and treatment as will best aid the Physician inh is daily practise.

"Surgery" is a book that is a distinct product of a rich experience. Details of greatest Clinical importance have been stressed while historical matter as well as bibliographical references have been deleted. The rapid advances in surgery during the war are carefully reviewed thus improving on earlier editions. The observations on military surgery have been contributed by Doctor Lee who served with the French army in '15 and later with the American troops.

Revisions of the previous texts include many radical changes and many additions to those portions dealing with surgical technic, wounds, plastic operations, blood transfusions, fractures and amputations including less important divisions.

Altogether "Surgery" is an indespensable reference book for the bsuy practitioner and clinician.

Operative Surgery

John Fairbairn Binnie—A.M.C. M. F. A. C. S. Fellow of the American Surgical Association, Published by P. Blaikiston Son & Co.

Eight editions of this comprehensive manual have appeared and, each edition finds its popularity unabated, and with good reason, for few works rank in importance with this splendid work. Operative Surgery, carefully avoids the viewpoint of a text book for Students, where emphasis must be placed on common rather than on unusual operations of Surgery. The constant aim as many of our Surgeons know, is to give aid to the Surgeon when he is in trouble. Much space has been given to operations that are rather rare—perhaps more than to many of far greater importance, but which should be familiar to every one. Perhaps the greatest changes in the New Edition, will be found in the chapters on Thoracic, Abdominal and Plastic Surgery. These have been carefully re-written. "Surgery" is a splendid collection of practical experience, which up-to-date clinicals will appreciate and enjoy.

The Surgical Clinics of North America.,—W. B. Saunders Co. J. F. Hartz, Co., Ltd. Toronto.

When this progressive company decided to broaden the scope of this work it was felt it would fill a much needed place but it is doubtful if they appreciate the value of this constructive service to physicians far and near.

The April Issue is at hand and is replete with up to the minute information contained in articles of value to those who wish the la-

test thought in the medical world.

We append a partial list of contents of a most interesting number,—

Clinic of Dr. John F. Erdman, Post-Graduate Hospital— Exophthalmic Goiter; Cystic Adenoma of Ovary; Duodenal Ulcer; Chronic Suppurative Mastitis; Chronic Cholecystitis

Clinic of Dr. Willy Meyer, Lenox Hill Hospital--The Importance of Posture in Postoperative Treatment.

Contribution by Dr. Charles L. Gibson, Attending Surgeon, New York Hospital, and **Dr. Kenneth Johnson,** Instructor in Surgery, Cornell University Medical College—Pneumococcus Peritonitis.

Clinic of Dr. Eugene H. Pool New York Hospital—Operation for Removal of Complete Cervical Rib

Clinic of Dr. John A. Hartwell, Bellevue Hospital, Second Division Cornell University Medical College— Suture of Musculospiral Nerve Forty-six Days After its Section By Stab Wound; Chronic Osteomyelitis; Acute Empyema; Cancer of the Rectum; Non Tuberculous Inflammation of the Cecum; Chronic Gastric Ulcer

Clinic of Dr. Allen O. Whipple, Presbyterian Hospital—Surgery of the Biliary Tract

Clinic of Dr. Fred H. Albee, Post-Graduate Hospital— Plastic Surgery of the hip and femur

Clinic of Dr. Leo Buerger, New York Polyclinic Medical School and Hospital; Clinical Lectures on some Complications of Urinary Lithiasis

Clinic of Dr. Waltron Martin, St. Luke's Hosptal, Tuberculosis of the Lympha tic Vessels of the Leg and of the second Metacarpal Bone, Secondary Elephantiasis

Clinic of Dr. Fordyce Barker St. John, First Surgical Division (Medical Department, Columbia University), Bellevue Hospital—Empyema

Clinic of Dr. Charles Gordon Heyd New York Post-Graduate Hospital—Duodenal Ulcer; Perforation; Adhesions to Gall-Bladder;Posterior Gastro-enterostomy; Chronic Appendicitis; Pyloric Syndrome; Appendectomy Cholelithiasis; Cholecystectomy; Appendectomy; Swallowing of Small Hat-pin 5Cm. in Length, with Penetration of Duodenojejunal Junction; Exploratory Laparotomy; Removal of Foreign Body Acute Appendicitis; Perforation; Appendectomy

Clinic of Dr. Byron Stookey, Neurological Institute— Brachial Plexus Injuries

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DIAGNOSTIC AND THERAPEUTIC TECHNIC.

A Manual of Practical Procedures Employed in Diagnosis and Treatment.

By Albert S. Morrow, A. B. M. D. F. A. C. S.

Published by W. B. Saunders Co. Canadian Agents J. F. Hartz Company, Ltd., Toronto.

Advances in diagnosis have made necessary a further revision of this admirable text. Much new material has been introduced as well as new illustrations to elucidate the text.

Every effort has been made to bring the present volume up to date and maintain the practical character of previous editions, the changes and additions appearing in this new edition will add materially to the usefulness of this already well proven volume.

While some of the methods detailed belong essentially to the domain of the specialist, the majority are every day practical procedures which the hospital interne or general practitioner may be called on to perform. There is, perhaps no other work which sets down in such readily usable form the valuable information of the work.

The plan of the work comprises first, a description of certain general diagnostic and therapeutic methods and, second, a description of those measures employed in the diagnosis and treatment of diseases affecting special regions and organs of the body. Operative methods have been omitted as far as possible, only those required in emergencies or which form a necessary part of some of the measures described.

Nothing is left to the readers imagination. Profuse illustrations characterise every chapter. Thus the reader has at a glance the technic of various procedures. The work of Doctor Morrow is in every way what it claims to be, A Manual of Procedures.

Twenty-three exhaustive chapters cover a wide range of subjects etc. And every subject has been handled by a man who has thought and experienced much.

The Lesson Taught By Nature.

(Toronto Star Weekly, June 25, 1921.)

Nature makes no mistakes in her work. Suppose she had made water contract instead of expanding when it froze. Think what would have happened.

The ice, instead of floating on the surface to be melted by the warm spring suns, would sink to the bottom, and soon the whole world would be a frozen, lifeless planet of ice.

Nature planned that the oxygen of the atmosphere should be diluted with four parts of nitrogen. Without this dilution every tree and shrub would be burnt to ashes with the first appearance of the sun.

Even iron would flare into a flame, and those steel bands that bind commerce together in a network of railroads would become nothing but streaks of iron rust.

Nature planned that sunlight playing upon the ocean's surface should transform water into vapor collecting into clouds; that atmosphere currents should coax the millions of tons of moisture-laden clouds continentwards. She planned electrical disturbances combined with thermal conditions to precipitate rain. And the rain, seeking the rivers, goes back once more to the sea, thus completing the cycle.

More wonderful still is nature's method of manufacturing and preserving food. She manufactures food through the leaf of the tree, the shrub, the vine, and the vegetable. Through the leaf she extracts carbonic gas from the air.

Air contains only three parts of carbonic gas out of 1,000. She rejects the 977 other parts and uses only C02, as the chemists call carbonic acid.

Not only does she use C02 for manufacturing food, but she uses it to preserve food.

Break the skin of an apple or bruise a strawberry and see how quickly the air decays it.

For it is air, full of oxygen, which spoils the flesh of the fruit. First it oxidizes it, then the floating germs which are in every breath of air in millions, go to work on the exposed flesh, and putrefaction comes quickly.

Oxygen oxidizes and destroys. Carbonic acid preserves the purity and flavor of nature's products.

When the ancients, from the abundant harvest of their vineyards, crushed the juice of the grapes into stone crocks, once more a provident nature intervened. She planted in the open vessels of fruit juice tiny yeast cells that floated about everywhere, and the yeast cells multiplied rapidly by budding under ideal conditions at the rate of a billion from one yeast cell every ten hours. These yeast cells manufacture carbonic gas in the beverage to prevent the drink from spoiling and to add to its subsequent enjoyment.

The human palate is never charmed with a baked concoction of flour, sugar, lard and water. But let nature put millions of tiny bubbles of carbonic gas in the rising dough prior to the baking and we have the modern flavory bread.

Man sought to improve upon nature's process in bread making. He tried to inflate the dough with air by mechanical means. The air inflation not only contaminated the resulting bread but it impaired the flavor.

The lesson has been plainly written for generations that of all known gasses carbonic gas is nature's selection for food products.

And in millions of homes and food factories at countless cost, nature has taught us that air is the most insidious and destructive of all food gasses. It is food's enemy. For air contains free oxygen which kicks up a chemical fuss in foods. The organic by-products of oxidation in food are dangerous. And Nature has provided that the oxidation shall be accompanied by the development of off flavors. Thus rancidity in butter, for example, becomes the danger signal. The taint tells us that the butter is unfit for human consumption.

Then the air introduces atmospheric bacteria into foods, together with free oxygen, in which they thrive.

This free oxygen not only fosters bacterial development and unites chemically to form unsavory compounds, but also modern science has indicated that the free oxygen reduces the amount of vitamines, that mysterious growth principle without which man would starve.

The housewife discovers to her sorrow the spoiled jar of fruit on her pantry shelf. She has not sealed it perfectly airtight. Perhaps only a thimbleful got in, but only by completely barricading the great enemy out may the housewife have every assurance that her fruit will be good when opened

For years this lesson has been written for us in letters as big as a house, and so plain that a child can understand it; air is food's most destructive eternal enemy, and carbonic gas is food's natural ally and friend.

Air did its greatest damage in dairy products. The destructive action of air in butter was so well understood that scientists sought to prevent its introduction into the butter mass by churning in vacuum.

Dairy products were first conceived in the imagination of man. Had nature originated them, she their mass pure carbonic atmosphere instead of air, just as she does in fruits, vegetables, and grains. Just as she does in bread and beverages since man learned how to let her work with yeast.

Flies As Distributors of Intestinal Protozoa

Since the classic positive demonstration by Smith and Kilbourne that insects may be instrumental in the transmission of disease, the house fly has often been accused of being one of the disseminating agents. Today this familiar insect pest stands not only accused but also repeatedly and convincingly convicted of the serious charge. The association of the fly with pathogenic bacteria is frequently pernicious to public health. The micro-organisms of suppuration, the germs of typhoid, cholera, dysentery and tuberculosis, not to mention others less prominent in the public mind, have been detected a league with this omnipresent insectt raveler. The incrimination that epidemics may be brought about through the dissemination of infections material by flies has repeatedly been sustained. How persistently they may harbor the sources of danger is shown for example, by Ficker's [12] observation that flies fed on typhoid cultures may still give off the bacilli twenty-three days after infection. Heretofore the bacterial parasites have claimed foremost consideration in relation to the fly. But now a new menace looms up. Root, [13] an entomologist of the newly established School of Hygiene and Public Health at Johns Hopkins University, has demonstrated the possibility of a hygienically undesirable association between flies and intestinal protozoa, including the genus 'Endameba of unsavory reputation. Fortunately, the free forms ingested by flies are apparently killed within an hour, without encysting. But cysts of the intestinal protozoa survive much longer in the bodies of flies. According to Root, flies feeding on a human stool containing cysts or free forms of intestinal protozoa will take large numbers of them into their intestines and deposit them again in their own feces. Since all stages of the protozoa are killed within a few minutes by drying, such fly feces are dangerous to human beings only when deposited on moist or liquid foods. A fly which has once ingested fecal material containing protozoa may deposit feces of its own which contain the infective forms of the protozoa at any time, from a few minutes after feeding until the most resistant forms, the cysts, are dead. The deposited cysts of amebas may survive as long as two days under favorable conditions. These experiments emphasize anew the importance of flies as carriers of disease-producing organisms from human feces to human food.--Jour A. M. A. June 4, 1921.

12. Ficker: Arch. Hyg. 46: 274.

13. Root, F. M.: Experiments on the Carriage of Intestinal Protozoa of Man by flies, Am.. Hyg. 1: 131 (March) 1921.

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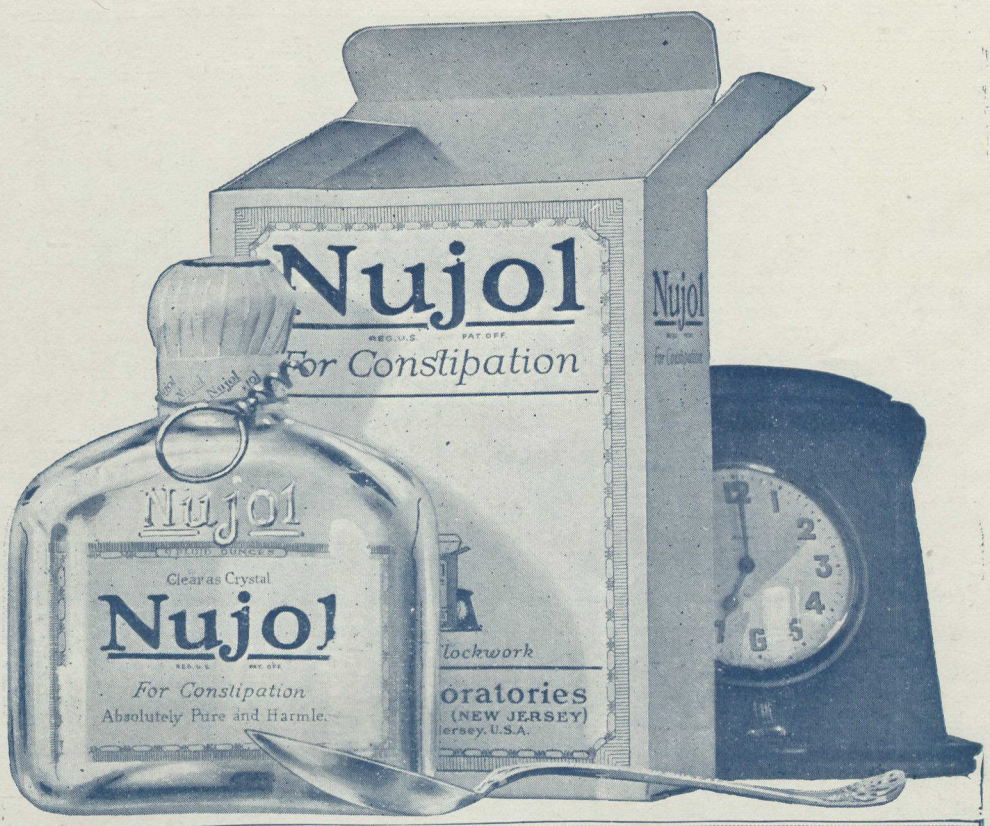

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