pathetic and vagus in especial. The increased oxidation of nitrogenous tissues, the commensurate evolution of heat, augmented heart's action, and the non-elimination of metamorphosed products, are the great predominating and fundamental changes in fever. These are the forerunners of all other morbid processes, and between the sum of their excess and the degree of perverted secretion there is correspondent relation. Increase of heat is the symptom pathognomonic of pyrexia. In the recognition of specific differences in fever, we are by parity of reasoning compelled to admit that their material causes differ. The character of tissue-change is determined by the character of the specific poison. It is the opinion of modern pathologists, that the *materies morbi* always invades the organism from without. We now have a vast array of proofs that overcrowding, bad or insufficient food, and mental depression, are the main circumstances which precede epidemics of typhus; that decomposed organic matters produce the enteric form; and that relapsing fever is so apt to follow on the heels of destitution, as to have acquired the synonym of famine-fever. Such are the cognisable, the preventable states, entering into their causation. Those vital and chemical processes which produce combustion of what is called the store-albumen of the blood, mainly give off urea and uric acid; and it is to the retention of these urinary solids that prominent symptoms and intercurrent affections are almost if not wholly owing. It is from these products of metamorphosis that congestion, a low form of inflammation, and uræmia, supervene. Hence, in treatment, to favour elimination is of supreme importance. Before all this new light shone forth, our remedies were prescribed with great dubiousness and much perplexity. We could not anticipate events. We did not know what to expect during the course of the respective species. By the non-recognition of those types which are so distinct and reverse in their essence and phenomena, fears were then unnecessarily aroused, and dangerous symptoms were sometimes regarded with too little heed. In this our day, we know typhus by its mode of accession, its rubeloid rash, the absence of diarrhoea, the grave impress made on the great nervous centres, the drawing in of the abdomen, and the average date of the crises. In enteric fever, its slower beginning, the lenticular rose-coloured spots, diarrhoea, tympany, pain and gurgling in the right iliac fossa, the cleaner tongue, and less cerebral disturbance, tell plainly of its nature. The sudden accession, quick pulse, great heat, icteric tendency, the abrupt resolution by diaphoresis when the apyrexial state becomes at once complete, and, in the course of a few days, the repetition of primary symptoms, pronounce the relapsing type. Nearly thirty years ago, I pointed out the fact that the temperature in relapsing fever may be 107 or 108 deg. Fahr. without the case assuming an alarming form. In typhus, and in the enteric species, we contemplate with deep and just anxiety such a high reading of the thermometer. Again, in the two last named types, sudden and powerful diaphoresis is not unfrequently a fatal symptom. In each of these three species, we now not only know great cardinal and distinguishing characteristics during life, but what to look for—all changes which we do not expect to discover till after death. In typhus, there is no specific lesion. We do, however, in typhus find brain-atrophy, œdema of the pia mater, and active and passive congestion; but in enteric fever we find specific lesions in the ulceration of the agminate and solitary glands of the ileum, and sometimes sparsely scattered in the colon. In a number of *post mortem* examinations made on those who had died of relapsing fever, I did not in a single instance find these ulcerations, but always more or less of splenic disease. In typhus, we dread cerebral mischief and muscular degeneration enfeebling the heart; in enteric fever, failure of cardiac power from ganglionic impression made by the specific poison, intestinal hæmorrhage, and perforation; and in relapsing fever, cholæmic and uræmic poisoning are often associated with the fatal catastrophe. Some time ago, at one of our Branch meetings, I read some cases of uræmic poisoning, and showed how the phenomena of this mode of blood-contamination closely resemble the phenomena of essential typhus. The typhoid state of the specific pyrexia, and the typhoid state from renal disease, are sometimes so correspondent, that the thermometer alone can solve the difficulty. I know no instance in which thermometry so opportunely and in such elucidative manner comes to our aid. Again, during the first week of continued fever, to note the temperature is often to conduct us to a right diagnosis. Such are some of our gains concerning continued fevers.

Gentlemen, I will no longer encroach on our limited time; and I may say, with the poet,

"Ante diem clauso componat vesper Olympo."

I have endeavoured to concisely indicate some of those great advances which have latterly been accomplished, and which have signally extended the boundaries of medical science; but a vast array of acquisitions of the deepest interest remain untold. Had the opportunity been given, much in physiology and therapeutics might have been

recounted; and, as pertains to preventive medicine, the onward march has been commensurate with any of those kindred subjects which come within our studies. Whatever progress may have been made in any of the physical sciences, the progress in medicine has been equal to that of any. During the last five-and-twenty years, more has been achieved than in any previous century. A higher standard of education, better clinical teaching, and more thoroughness of acquirement, are telling favourably on the student. Silent workers—and they are many—in the wards, the laboratory, and the study, are evolving great truths, and continually fortifying the busy practitioner with fresh facts of inestimable value. The medical profession is being held in higher and higher estimation. There never was an age in which more zeal, more ability, and more loyalty, were found in its ranks; and there never was an age in which our exalted vocation was pursued with such success as it is in the present day. An enormous accumulation of facts—irrefragable, applicable, priceless facts—have made great stores of new knowledge, which daily is wisely, humanely being brought to bear in enabling us more certainly, more successfully to wage our war against the ravages of disease and death; and this knowledge, which is broadly recognised, solid, immutable, "will remain as the Danube and the Alps remain, because it is founded on the Beautiful and the True".

THE LIVER IN JAUNDICE.

By J. WICKHAM LEGG, M.D.,

Casualty Physician and Demonstrator of Morbid Anatomy to St. Bartholomew's Hospital.

[Concluded from p. 608 of last number.]

THE changes which the parenchyma of the liver suffers in obstruction to the bile-ducts have been very little studied. Oskar Wyss (*Archiv für pathol. Anat.*, 1866, vol. xxxv, p. 553), Leyden (*Beiträge zur Pathologie des Icterus*, Berlin, 1866, p. 85), and Heinrich Mayer (*Medizin. Jahrbücher herausgegeben von der k.k. Gesellschaft der Aerzte zu Wien*, 1872, Heft 11, p. 133), are almost the only three observers who have paid any detailed attention to this state. The liver at first increases in size; it becomes of a deep bilious or olive-green colour, and is said to be itself jaundiced. Its consistence is increased, and the surface and section are somewhat granular. If the jaundice continue long, the liver wastes.

The changes in the cells and in the connective tissue of the liver may be considered apart. In all cases of long continued obstruction to the bile-ducts, the connective tissue grows. The starting-point of this overgrowth is the place of obstruction itself, and the degree of the overgrowth depends upon the kind of obstruction. Thus the overgrowth is greatest in animals around whose bile-ducts a ligature has been placed. Here the presence of the ligature, and the accompanying disturbance of all the structures in the porta of the liver, cause a rapid and enormous overgrowth of the connective tissue throughout the whole of the gland. In such cases, I have found, on the fourteenth day after ligaturing the ducts, the most intense cirrhosis, so that the liver-structure seemed made up chiefly of connective tissue, with a few dwindled hepatic cells. This overgrowth of the connective tissue begins within a few hours after the operation. (See the author's paper on the Changes in the Liver which follow Ligature of the Bile-Ducts, in *St. Bartholomew's Hospital Reports*, 1873, vol. ix, p. 161.) On the other hand, if the obstruction be such that the connective tissue around the bile-duct suffers but little, the increase in the connective tissue is also but slight. In a case which I have recently examined, in which the obstruction was caused by the pressure of an hydatid cyst upon the hepatic duct, the increase in the connective tissue was small, and did not pass into the lobules. Further, there was an absence of those lymphatic corpuscles, which are so marked a feature in the new connective tissue after ligature of the ducts and in cirrhosis. I attribute this to the uniform elastic pressure of the fluid in the hydatid cyst, so different in its effects from those of a rough angular gall-stone, one of the most common causes of obstruction. In one of these cases, in which it would appear that the obstruction from the gall-stone was not complete, if the absence of jaundice be taken as evidence on this count, I yet found the connective tissue throughout the liver greatly increased, and containing many new lymphatic elements, so that, at first sight, the section of the liver, seen under the microscope, very strongly recalled a far advanced cirrhosis.

The view that the overgrowth of the connective tissue takes its rise from that surrounding the bile-ducts, is strengthened by the fact that, in all cases of permanent obstruction, the bile-ducts are found greatly thickened. Solowieff (*Centralblatt für die Medicinischen Wissenschaften*, 1872, No. 22, p. 337) also found the same morbid overgrowth of the

connective tissue in the liver after ligation of the portal vein, as I have found after ligation of the bile-ducts.

This overgrowth of the connective tissue was not altogether unknown to the older pathologists. Albers (*Beobachtungen auf dem Gebiete der Pathologie*, Bonn, 1836, p. 19), in speaking of cases of obstruction and dilatation of the bile-ducts, says the parenchyma of the liver is granular, rough, coloured yellowish brown; and that in one case the liver was really cirrhotic. It appears, he continues to say, that the cellular tissue of the liver is partly atrophied, partly indurated. Andral (*Clinique Médicale*, vol. ii, p. 534, 4th edition, Paris, 1839) noticed, in a man whose bile-ducts were much dilated, that the liver was small, deep green, very dense, and granular on the surface and section. These changes Andral seems to attribute to a fall on the right hypochondrium two years before death; but it should be noticed that the man had also been a drunkard.

The changes which the liver-cells undergo are less striking. Leyden (*loc. cit.*), from his experiments, drew too hasty a generalisation that a fatty infiltration of the cells followed all obstructions to the bile-ducts. This is not universally the case either in man or in animals. In man, I have yet to meet with the case in which fatty infiltration was the most prominent appearance. In some cats who died within a short time of the bile-ducts being tied, I have, indeed, seen this appearance; but I am inclined to attribute it to the liver having been fatty before the duct was tied—a state not at all uncommon in domestic animals.

The chief change in the liver-cells is atrophy. The size of the cells varies from a little smaller than natural, to twice that of a leucocyte when the growth of the connective tissue has been great. When the connective tissue shows less appearance of growth, the cells are less altered; they then preserve very nearly their natural shape and size. In other cases, the shape varies with the size; they tend to become oval or rounded; their outline indistinct. The nucleus is well preserved, shrivelled, or invisible. The contents of the cells seem to be chiefly fat and a few pigment-granules: the fat is rarely in large drops; and the pigment, in the cases which I have observed, not so abundant as the writings of others led me to expect. The arrangement of the cells in rays around the hepatic vein is altogether lost, when the obstruction has existed for any length of time.

One of the most important functions of the liver known to us is the preparation of glycogen. I have made several observations bearing upon the question, whether the liver continues its glycogenic functions when the gall-ducts are completely obstructed. I have found that, in cats, the glycogen disappears from the liver within a few days after the bile-ducts have been tied; and also that, on the fifth or sixth day after ligation of these ducts, irritation of the fourth ventricle is not followed by the appearance of sugar in the urine (*Archiv für exper. Pathologie*, 1874). It would appear, therefore, that within a few days after complete obstruction to the gall-ducts, the liver ceases to secrete glycogen.

Another function of the liver, that of secreting the bile-acids, is believed by Golwin (*Archiv für pathol. Anat.*, 1871, vol. liii, p. 433) to be abolished in long continued jaundice. He found that, in dogs in which biliary fistulae had been made and again closed, the bile-acids could not be discovered in the urine; and he concludes therefrom that, in long continued jaundice, the bile-acids are no longer produced. Further evidence will, however, be required before this opinion can be universally assented to.

Some physiologists appear to believe that the urea and uric acid excreted in the urine are formed in the liver. The experiments of Gscheidlen (*Studien über den Ursprung des Harnstoffs im Thierkörper*, Leipzig, 1871) seem to make this theory more than doubtful. However this may be, in complete obstruction to the gall-ducts I have several times found that, although the urine was much increased in quantity, yet the amount of urea excreted in the twenty-four hours was quite natural.

In some cases of long continued obstruction to the bile-ducts, the liver-cells have been found completely destroyed; nothing but a fatty *atritus* being seen under the microscope, and not a single liver-cell being found in any of the preparations. I have myself seen this appearance only in acute yellow atrophy of the liver. Yet it is noteworthy, that the very first case in which the liver-cells were found to be dissolved was one in which a permanent obstruction to the ducts existed (Thomas Williams, *Guy's Hospital Reports*, 1843, p. 444). The relation, as to cause and effect, which exists between obstruction to the bile-passages and dissolution of the cells, is dubious. I am unable to admit Oskar Wyss' explanation, that the solution of the cells is simply a *post mortem* change. I have frequently kept a liver from a jaundiced patient, even in the heat of summer, without any preservative fluid, and yet been able to recognise the cells many days after death. In one case, where the obstruction to the ducts was complete, and the jaundice

had lasted a year, the liver-cells were easily recognised on the seventh day after death, when the liver gave plain signs of putrefaction.

This solution of the cells was attributed by Theodor von Dusch (*Untersuchungen und Experimente als Beitrag zur Pathogenese des Icterus und der acuten gelben Atrophie der Leber*, Leipzig, 1854, p. 36) to the action of the bile upon the liver; but his statement, that the bile dissolves the liver-cells, has been disproved very satisfactorily by Kühne (*Archiv für pathol. Anat.*, 1858, vol. xiv, p. 324). It is true that the bile renders the outline of the cells indistinct, and the cells themselves become difficult to see; but the outline of the cells can always be restored by the addition of some colouring matter to the slide. I have verified these experiments on several occasions; and there is no likeness whatever between the sudden and complete disappearance of the red blood-corpuscle when acted on by bile, and the slow obliteration of the outline of the liver-cell under the same circumstances.

It is still important, however, to keep in view the results of Leyden's experiments (*Beiträge zur Pathologie des Icterus*, Berlin, 1866, p. 60) upon the slow absorption of the bile-acids. He found that, after injection of the bile-acids under the skin of frogs, the liver-cells showed a marked fatty infiltration; the muscular fibre of the heart a diffused granular appearance. In one case, it is stated that the liver-cells were destroyed. The bile-acids had produced a parenchymatous degeneration of the liver and heart—a common effect of many poisons, such as phosphorus, sulphuric acid, alcohol, etc., and, as I have recently shown, of raising the natural temperature of the body (*Trans. of the Pathological Society*, 1873, vol. xxiv, p. 266). It is quite possible that in these cases, where the liver-cells are found destroyed after death, the long continued circulation of the bile-acids in the blood may have produced their physiological effect, as described by Leyden; and the liver-cells may have thus been dissolved. The appearance of solution of the cells of the liver is, however, not often met with outside acute yellow atrophy; and it would be desirable to have recorded further cases, well authenticated by competent observers.

ON ERYSIPELAS DURING THE PUERPERAL CONDITION.

By JAMES REID, M.A., M.B.

It is generally agreed among medical men that to lying-in women there is no greater danger than exposure in any way to the poison of erysipelas. Among the many sources to which puerperal fever can be traced, this is regarded, and apparently on the most ample grounds, as one of the most potent; though there are authorities who maintain that the poison of puerperal fever is a specific one, and that other specific poisons will not engender the malady. The following case seems, at the first blush at least, to favour the latter theory.

On being called one morning lately to see a woman who was daily expecting her confinement, I found her suffering from a severe attack of erysipelas of the head and face. She had been ill for a couple of days, and was steadily getting worse, the tumefaction over the whole face being very considerable by the time I saw her. There were no symptoms of impending labour in the morning; but in the evening, after a very few pains, she was suddenly delivered of a healthy child. Not having hitherto had a case where labour came on during the height of an attack of erysipelas, and having in view the current theory, I formed in my own mind a grave prognosis, and my opinion was shared by a medical friend who saw the case. The treatment from the outset and throughout was simply beef-tea, milk, eggs, and port wine *ad libitum*; with fifteen minims of the tincture of iron every two hours. During the first two days after parturition, the erysipelas increased in intensity, the contour of the features being in a great measure lost, and the neck being invaded. At one time, there was slight delirium, but this wore off. By the third day, there was a change for the better; and there was now steady progress towards convalescence, the erysipelas terminating in resolution, with desquamation of the cuticle, after a duration of ten days. During this time, the patient consumed a large quantity of the remedies mentioned, and took in all three or four ounces of the iron tincture. The lochia were at no time suppressed or unnatural, nor was there ever the slightest symptom that the uterus was affected. There was, further, no febrile state, more than was accounted for by the erysipelas; and this was not intense, nor did it take on in any way a typhoid aspect. In short, the erysipelas ran its course in a most favourable manner, ignoring as it were, and not interfering in the slightest degree with, the mother's puerperal condition.

Now here is a case where, on the current theory, puerperal fever might have been confidently looked for. If puerperal patients be so susceptible to the poison when conveyed by the atmosphere or by con-