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On the

Icterus Neonatorum

by

James C. Cox

On The

Icterus Neonatorum

To The Medical Faculty of
The University of Edinburgh.

Gentlemen,

It being a regulation of the University, that Students, before having the degree of M.D conferred on them, should present to you examination a Medical Thesis, of their own selection: I after much consideration and indeed with some perplexity now submit for your inspection the

Subject of "Infantile Jaundice" one in itself extremely interesting, and concerning which, Authors are not to this day agreed upon -

I have drawn my conclusions greatly from cases, it having been my lot to witness many during the past

diseases, and I trust I have as clearly as my experience will permit, distinctly stated, what seems to be the right and proper Pathology of the disease -

I must beg your kind patience and lenience, and hope for but little criticism during your perusal of these pages -

It appears to us, that Jaundice, by which term we mean, a peculiar appearance presenting itself on the surface of the body, namely that of a yellow hue, and not as indicating any form of hepatic lesion or that of its appendages, which occurs in infants, may be divided into three great classes, according to the severity of the symptoms which accompany that phenomenon.

The first form, though but slight in its effects on the constitution of the infant, is happily, the most frequent in its appearance.

The Second, although usually not fatal is much more permanent and producing effects of a more serious nature, and

Thirdly that form which it seems beyond the art of man to alleviate.

We shall first speak of that milder form of the disease, if such we may call it, and described by Dewes as follows

"The Skins of new born infants

are frequently of a yellow colour - but this yellowness is not of a deep tone, though very generally deepened - This appearance may continue for several days and then disappear, without the aid of remedy, or without leaving any evil behind - It is difficult to say to what this yellow tinge may be owing; certain it is, that it cannot be owing to the presence of bile since neither the urine nor the whites of the eyes assume the yellow hue - We know that changes from a white to a yellow skin take place upon certain occasions, and this sometimes with surprising rapidity by some result change in the cellular membrane or into mucosum, without our being able to declare the cause - This is remarkably the case in yellow Fever where the presence of bile cannot be detected in the circulating fluids - The same thing takes place with certain people from strong affections of the mind, or peculiar derangements of the stomach, without the aid of bile; the same thing occurs

occasionally with the new born child, therefore many yellowness of the skin must not be mistaken for jaundice, as it would lead to great errors in practice. Our attention is frequently drawn to this appearance by nurses and when it is observed, we make it a rule to investigate the condition of the child lest a real jaundice may be present. We direct our attention, first, to the whites of the eyes and the secretion of tears, we have reason to believe there is no jaundice if neither of these symptoms be present. If the first be yellow, we suppose it a little strange ground for belief that there is jaundice, and if the fæces are pale these they should be of a clay colour, we are sure the child has a genuine jaundice. We have known however all the marks or signs of this disease to exist, (with the exception of pale or clay coloured stools) without the child appearing to suffer in the least. They all have disappeared spontaneously -

the notice them that this author is of a decided opinion, that this appearance is not owing to the presence of bile circulating in the blood, with whom Dr. Watson fully concurs in the short notice we find on the subject in his Lectures, on the Practice of Physic

"All systematic writers, says he, follow Cullen in making jaundice a common disorder among newly born children. The Icterus neonatorum ours, they say a few days after birth, is not attended with any suffering or obvious disturbance of the bodily functions and soon disappears. Now there seems reason to believe that this is not Icterus at all, and has no relation to the biliary organs. The surface of the infant is frequently at its birth of a deep red colour, from hyperemia, or congestion of blood: presenting a condition which falls little short of a mild but universal bruise. By degrees the redness fades as bruises fade, through shades of yellow into the genuine flesh colour. Such I am assured by those

who are more conversant with these matters than myself, is the pathology of the "Icterus Infantum".

But the former of these authors does not venture to offer any opinion as to the cause of this disease, while the latter, seems to attribute it to those changes which we observe the colouring matter of the blood to undergo when extravasated; but although this symptom may somewhat resemble such a change, it appears to us, that there are no grounds on which we can establish such a theory - for, how could such a general staining of the surface be produced? It has been suggested, by the uterine contractions during parturition, but if such were the case, we should expect to find the largest children affected with it most intensely, and in those in whom labour has been most difficult, so far from this being the case, we find from statistics, that it is those children which are most robust & healthy

that are least affected - and again, we should expect to find the presenting part on which the Caput Succedaneum is produced most intensely discoloured, but by careful observation we are unable to say that such is the case -

Can this be the same disease which is spoken of by Hart? which is likewise as easily treated and of as apparent slight importance, when he says, "It sometimes happens that some two or three days after birth, the skin of a new born infant assumes more or less of a yellow colour, that this colour gradually deepens and becomes apparent in the conjunctiva as well as over the whole surface of the body, but after a day or two the yellow tinge diminishes, and in the course of a week or ten days completely disappears - little if any indisposition having attended any stage of the affection - The general resemblance of its symptoms to those of jaundice in the adult

has led some persons, to attribute this "Icterus neonatorum" to retention of the meconium, or to gastric or intestinal disorder, produced by unsuitable food - On the other hand the slightness of the constitutional disturbance which attends it and the occasional absence of all signs of disorder of the general health has given rise to a different opinion, according to which, the recurrence is attributed to physiological rather than pathological causes - With reference to the first of these views, it may be observed, that infantile Icterus is often unattended either with retention of the meconium or with any other form of intestinal disorder, while very serious disturbance of the digestive organs, or even complete retention of the meconium from an unpervious condition of the [redacted] rectum, may exist, without being associated with a yellow tinge of the skin"

We beg to add to this moreover that if it were from absorption

of the meconium, we should expect to find the child born in this condition, for the meconium lies long in the intestinal canal before birth; or at least we should not expect to find it occuring concurrently with the due performance of the skin and of respiration -

He then goes on by saying - "the assumption that it is a perfectly natural state, in which the skin and other secreting organs, are called on for a few days to assist in disposing of the bile, until the demand for it to minister to the digestive functions becomes equal to its abundant supply, is shown to be erroneous, by the circumstance that jaundice does not affect perfect - ly healthy children, who have been born at the full time, have been nourished exclusively at the mothers breast, and been sheltered from cold, without being overburdened with clothing or confined in a vitiated atmosphere - In the Dublin Lying In Hospital, where the children are

depended by the most watchful care from the evils either of cold or of a vitiated atmosphere, the occurrence of infantile jaundice is rare; while in the Foundling Hospital at Paris jaundice is so common, that comparatively few infants escape it. Almost all the children at the Foundling Hospital have been exposed to the action of cold while being brought to the institution, and suffer from the continued influence of cold and bad air when inmates of it, — causes which interfere very seriously with the due performance of the skin and of the respiratory organs" —

But why should these authors assume that the bile, which they say, is not yet required for the function of digestion, should be disposed of by other means after birth than those which are so effectual in disposing of it during uterine gestation? but granting that part of it is thus eliminated, is it not probable that an amount of bile so great, as to produce, as it does in some

cases, a colour so diffused and intense would not produce some of the physiological effects, a slight degree, which we know to result from its presence in the blood, and would also necessarily show itself in the urine, but we have never been able to detect it in such cases, nor does it stain the napkin on which it has been passed -

Watt then draws our attention to the fact, which is quite in accordance with our own experience, that "the children in whom jaundice is most frequent and most intense, are the immature and the feeble; while in none is it so often met with, or in such an intense degree, as in infants affected with induration of the cellular tissue, in whom the yellow colour is so deep as to be manifest in the serum infiltrated into the cellular tissue, or poured out into the cavities of the chest or abdomen. Interruptions of the functions of the [illegible] of the lungs

are, as you know, the grand characteristics of that affection, while in many instances of it the foetal passages are still pervious, and the blood circulates in part through channels which ought to have been closed from the time of birth; these facts seem to substantiate the opinions entertained by many authors of high authority, that the jaundice of young children is not due to any cause primarily seated in the liver, but rather to the defective respiration and the impaired performance of the functions of the skin, of which the hepatic disorder and consequent jaundice are but the effects"—

It is our opinion that these authors have been speaking of the same form of the disease, but ascribe it to causes which we think fallacious. The only point in which they differ in their description of the symptoms, is that the latter states that the conjunctiva is tinged while the former states to the

contrary, they also differ in their statements as to the existence of life in the urine -

According to our own experience, the following are symptoms which attend a case similar to that which we now refer to, derived from careful observation on twelve cases -

The skin of the child usually on the second day after birth, but sometimes later, becomes of a dark red colour as though from slight vascular excitement; there is no induration of the cellular tissue in the greater number of cases, occurring only four times out of the twelve, but it is of a natural feel and consistency - This blush fades slowly and is replaced by a yellow tinge, varying in intensity, resembling that seen after a slight bruise, appearing first on the sides of the nose and becoming more intense in the face and upper part of the back, but ultimately diffused over the whole surface of the body - The skin in the more intense

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cases is dry, particularly in those in which there is indurated cellular tissue, and in such cases, we have noticed desquamation to occur with a subsidence of the characteristic symptoms; in the less intense cases, the skin is moist. The conjunctiva is not coloured, nor does the urine contain bile or stain the napkin on which it was passed; the tongue is slightly furred, and the bowels in only one case that we have seen were constipated; the feces of a dark green colour, just as in the meconium of a child not thus affected. There are no symptoms of unusual drowsiness, and the child sucks freely at the breast. This condition may continue for several days but in the greater number of cases that have come under our notice, till the third day after its appearance usually, leaving the skin in a natural condition.

"M. Hervieux in a recent thesis, has endeavoured to explain a more

correct account of this disease than that hitherto given, derived from his observations on fifty five cases. He rejects the the various divisions of the disease as so many hypothetical suppositions, derived from deviations of what occurs in the adult, and recognises but one form always appearing during the first month, and attended by some symptoms and morbid changes. He combats the opinion of M. Legu that the induration of the cellular tissue is always accompanied by jaundice; for in 90 cases of this disease jaundice only manifested itself 31 times, and in 45 cases of jaundice the induration has also been met with but 31 times, coincidence but not cause and effect. He also denies that enteritis is a cause, although a common complication of this as well as of other diseases of this age. Nor does he admit that the engorged or inflamed state of the liver, as any other than an epiphenomenon would produce it; still

it is from the disorder in the functions of this organ, in its transition from an organ of hæmatosis to one of biliary secretion that the icterus arises.

His anatomical observations on the disease lead him to conclude -

First, that all the organic tissues are in different degrees liable to the icteric effusion -

Secondly. the intensity of colour which these tissues acquire is in direct proportion to the amount of their vascularity. He enumerates the various structures but we need not follow him here, merely observing that the bones, ligaments, and cartilages were in a certain number of cases undoubtedly coloured, the Sclerotic, however being found in only one. not only were the serous and mucous membranes coloured but likewise the fluids which they secreted. The biliary apparatus was found to have undergone just the same changes as it does in Schirrus or ulcerites, the so frequent complications of Icterus. But neither

the biliary ducts nor the umbilical veins presented the marks of inflam-mation described by some. The yellow patches in the parenchyma of the kidneys were of two sorts, described by Billard, the one arising from icteric suffusions, the other of a far brighter colour unconnected with it. The Respiratory apparatus shows evident marks of colour; but the nervous system and the brain in particular were intensely coloured in 31 cases. The tinge of the skin is often modified into a coppery or orange colour by its coexisting vascularity.
Its complications, from which alone arise any danger in this affection, are purely accidental, being mere coincidences. In these 45 cases such complications consisted of Sclerema, 31 times. Enteritis 15 times. Pneumonia 2. Purulent Opthalmia 10 times" —

To what then are we to attribute this appearance to be owing?

The question which at once suggests itself is. Does this affection depend on the presence of bile

or not?

There are other arguments brought forward than those already enumerated to establish the theory that it is from the presence of bile, for instance; it is said to be owing to the change which occurs in the circulation after the birth of the child; for the ductus venosus which a few hours previously had been the direct passage of the blood from the placenta to the child through the liver, was not till some short time after birth sufficiently contracted to obstruct the flow of blood from the vena Portæ through it and consequently, the blood which should have been deprived of its bile by being passed throug the liver before entering the general circulation was passed directly on, and hence diffused through the whole tissues of the body.

This as well as other of the theories would be quite sufficient to account for the most prominent symptom of such cases; viz. yellowness

of the skin, but other symptoms which we know to be owing to the presence of bile in the circulation, do not corroborate any such theories, but does those more severe forms of this affection which will be spoken of hereafter - If then we can establish the fact, that it is not owing to the presence of bile, which I believe we can by proving that it is not in the urine; in order to solve the question, we must look to the organ which is affected, and enquire, if it be not owing to an abnormal or imperfect performance of its function that it is due -

The skin now for the first time is called upon to execute that function which is so important to the bodily health, and need it be wondered at, that an organ so extensive when thus called upon should be found for a time inadequate from undue exposure to cold and from being improperly cleansed, for it is to be remembered that we have evidence from the statistics

of the Lying-in Hospitals at Paris and the Dublin Rotunda, that it is in proportion to the neglect and exposure to bad air that children are thus affected - How this peculiar colour is developed is impossible for us to say any more than can be imagined how these rapid changes of black hair to a snow white can be effected in a very short time, simply by a mental operation - the probability we think is, that the cells producing the sebaceous and other secretions must be in an abnormal state, and either, by a morbid action secrete a yellow matter just as the first few drops of milk squeezed from the breast are not the natural colour of the milk but of a thick yellow appearance; or it may be that the cells which were first formed have had their contents as it were concentrated, and which are now being pushed to the surface by a development of new cells beneath, and hence give rise to the opaque yellow appearance observed.

Cardis says, "in some instances the skin of the infant will be marked by dull yellow irregular blotches (Maculæ Hepaticæ) more or less extensive and sometimes occupying the greater part of the body. The colour of these blotches varies very much in intensity, and in cases where there exists considerable derangement of the alimentary canal; they occasionally assume a very dark hue (Melæna); in some instances they are accompanied with a prickling or tingling sensation. The disease appears most generally connected with derangement of the digestive organs; the colour of the skin being dependent on a morbid secretion from the cutaneous vessels; it has little or no affinity with Jaundice"—

Here then this disease is considered but very slight in its nature and it must not be supposed from Dr Harrison's statements that such complications are common in this disease, as those he has mentioned, for he has selected these cases from those great establishments for

the generation and derivation of disease, the Childrens Hospital at Paris, because they were fatal ones, and offered the opportunities of anatomical inspection.

Treatment

As to the treatment of this malady all authors seem to have come to the same conclusion, for although there are such a variety of opinions as to its Pathology, yet practically from the little effect it has on the bodily functions but slight interference of the Physician is required by nature for its removal, still Bier confesses that many children were killed under his observation by the use of "innerlicher medicamente" before he discovered the harmlessness of this change of colour, for it cannot be called a disease. He however was not content to leaving the matter to nature but recommended Clysters, Baths, Electricity, and Frictions to the abdomen.

Mansell and Tonson state that

"It can scarcely be called a disease, and find it commonly disappearing spontaneously and requiring no medical treatment - When it does not go off in two or three days, we may set matters right, by the administration of a dram of castor oil, or two or three grains of Rhubarb with one of Hydrargyrum c Cretâ"-

Burns was of opinion that the early use of Calomel would appear the most proper practice, and the Strength must be supported in all these cases by the breast milk, given with the spoon, if the child will not suck, and small doses of White wine Whey- best States that as the Respiratory function and that of the skin, increase in activity - which they will do if the cause of their imperfect performance be but slight or temporary the jaundice disappears of its own accord - great attention must be paid during its continuance to avoid the exposure of the child to cold, while no other food but the mothers milk should be given - If the bowels

be at all constipated a grain of Hydrarg ℈ Cetâ may be given, followed by a smale dose of Castor oil and the aperient wile often seem to hasten the disappearance of the jaundice; but in a large amount of cases even this amount of Medical interferance is not needed".

Dr. Harrison regarding Simple Icterus rather as a the sign of a new function temporarily exceeding its physiological limits, than as a disease, recommends that the case also should be left entirely to the resources of nature.

Ross, in his essay on diseases of Children says: "It is not to be regarded, nor is any thing needful to be done to remove it, as it will disappear totally and spontaneously at last. It is commonly said that the skin is left clearer and fairer by it than it otherwise would be without it; which seems a doubt: however it is an agreable delusion, and may help to reconcile us unpleasing an appearance.

We shall next treat of that form of Icterus occuring in the infant which is much more permanent in its duration and producing effects of a more serious nature, but are not necessarily fatal, as may be illustrated by the following case.

Mrs. Wilson Oct 30 delivered of her third child on the 28th of September last. She had an easy labour, and made a quick recovery.

The child a male, large and well nourished, was on the third day after birth observed to vomit much, and the skin and conjunctivæ to have become of a light yellow tinge; the feces were of a light clay colour and the urine deep yellow which gave with Nitric Acid evidences of the presence of Bile.

As the bowels were rather costive it was ordered a teaspoonful of Castor Oil. For the next three following days it continued much in the same state, when the colour of the skin became very deep and its mother complained that it vomited its

food immediately after sucking, and that it appeared heavy & drowsy so much so that it was with difficulty encouraged to take the breast.

It was now ordered very small doses of Hyd c Creta to be followed by a teaspoonful of Castor oil, which acted freely on the bowels. The faeces still continued pale and the urine to contain bile.

The Mercury was continued till the 7th when the child seemed much more lively, the colour of the skin to fade and the urine almost of a natural colour. no vomiting had occurred for the last two days.

The child ultimately recovered perfectly.

This form then unlike the last is one of pure jaundice and is spoken of by John Burns as follows.

In this form of the disease there is an obstacle to the passage of the bile into the intestine the child is costive and the meconium is paler than usual and after it is removed the stools become light.

coloured; the skin very early after birth becomes of a dusky yellow colour which extends to the eyes. The child sucks very little has occasionally a difficulty in swallowing, is languid becomes emaciated, moans much, is troubled with flatulence, sometimes with cough and phlegm in the trachea & vomiting, convulsions colic and fever occasionally supervene. In some cases the liver is felt large and the Hypochondrium is tumid. The urine is very high coloured. This disease often proves fatal in a week but it has been known to continue in variable degrees of violence for a considerable time, at last to disappear, though such children continue long delicate. With regard to the cause of this disease we find it consist in obstruction of the hepatic duct or ductus Communis, either by thickening of its coats, a pressure in consequence of enlargement of some part in the vicinity of the duct. Sometimes it proceeds from temporary obstruction

in the dust owing to viscidity of the bile - how some of these cases are irremovable others are not, but as we cannot "a priori" say what the cause may be in any particular instance, we must use the means of cure in every case -

Churchill states that the infant is sometimes born jaundiced, the skin and conjunctiva being quite yellow, but these are rare cases, but the symptoms of the disease are so characteristic that the disease cannot be easily mistaken - the skin is yellow or greenish yellow - the face looks thin, wrinkled and old; the appetite is diminished; if very young the infant sucks feebly and does not suck after the breast - the discharges of the bowels may be dark coloured; if the meconium have not been entirely discharged; afterwards they are generally whitish or greyish in some few cases their colour is natural - at the commencement of the disease the bowels are generally constipated, but I have seen an attack

ushered in by diarrhoea, which ordinarily occurs after a few days. The tongue has yellowish white fur especially towards the base and the palate occasionally exhibits whitish patches which resemble the false membrane of Muget. Vomiting occurs sometimes even after a moderate meal but it is by no means an invariable accompaniment, there is frequently some gurgling which the child shows by sudden cries and retraction of the limbs. Such are the ordinary symptoms of jaundice; in the greater number of cases there is neither swelling nor tenderness of the abdomen in region of the Liver, but, in some cases M. Beaumes mentions having the hepatic region swollen and tense. - When the disease is of a chronic character it is attended with progressive emaciation, tumefaction of the abdomen sometimes with edema of the lower extremities or effusion into the peritoneum, the tongue becomes brown, dry and of a dark brown Colour, and at an advanced stage there are

occasionally spots of purpura, or bleeding from the mucous membrane. Induration of the cellular tissue, also sometimes but rarely complicates the affection.

This disease may last from a few days to a fortnight and then the skin acquires its natural colour, the bowels become regular and the appetite returns. But although in general it is a mild disorder unattended by danger we find that now and then it proves fatal.

Cheyne describes it as an alarming disease; for says he when infants do recover it is with great difficulty it usually occurs on the third day after birth, for it is necessary that this time should elapse before the complete absorption and subsequent deposition of the bile into the blood can take place, it is attended with languor, flatulance, and bilious vomiting, and continues many days or even weeks. Sometimes it goes gradually away but generally ends in a fatal marasmus - When this disease is fatal,

it, in all probability is so from an original malconformation in the liver for we do not find upon dissection that it is a disease of the hepatic or of the common ducts, which, though somewhat contracted from the thickening of their coates are always pervious - the malconformation is an impermeable thickning of the beginning of the hepatic ducts, or as they are called Ductus Biliarii -

The disease has been supposed to arise from obstruction of the biliary ducts forcing the bile back upon the liver; the obstruction being occasioned either by meconium, or by inspissated matter elongating the ductus communis, or by the curdled milk, coagulating in the stomach or duodenum, distending them so as to make them press upon the duct; but Hebreden whose opinion is always entitled to the utmost deference says "that it has been supposed that an inspection of the abdomen may be great enough to hinder the efflux of bile; but this may be questioned, if we reflect that the duodenum has

seldom any solid contents in it, and that should it be so plugged up by them or compressed by the other intestines as to hinder the passing of the bile, it would for that reason, be incapable of admitting any thing into it from the stomach which is a supposition hardly countenanced by experience" -

Cases sometimes occur where the infants are born in this condition, either from causes already mentioned, or what is more frequent, from the mother having while in the pregnant state become jaundiced in consequence of the pressure of the uterus upwards on the hepatic ducts; the poisonous elements thus contained in the mothers blood are communicated to the embrio through the act of percolation, and these elements will produce, ceteris paribus, morbid effects on the latter similar to those observed in the system of the mother, or they may have been fatal before parturition had occurred, if not, but little need

require to be done, the source of the evil being now cut off and the noxious matter is quickly eliminated by the organs of excretion -

On looking back at the various opinions given by the authors quoted from, as to the cause of this malady, we must conclude that its treatment in like manner must vary much. If there should be a clogging up of the bowels by the meconium and the bile become thus absorbed by the surface of the intestine, or should it cause an obstruction by pressure on the orifices of the channels from which the bile flows, it is obvious our first duty will be to get rid of such an accumulation by a smart action on the bowels with a dose of Castor oil; or should it be from congestion or a torpid condition of the functions of the liver owing either to a change in the circulation or any other cause, or should it be from inspissated bile or thickened mucous in the ducts then one grain doses of the

Hydrar c Cuta, followed by a teaspoon-
-ful of Castor Oil would suggest
themselves to us, to recall into action
the functions of that organ; and
should any other cause in each
particular case manifest itself,
it must be treated in like manner
by the ordinary rules of our Art.
"Many authors are inclined to
use Emetics in these cases; for our
own part we have not had an
opportunity of judging of these
remedies, and from the opinion of
of D^r. Denis should be inclined to
doubt their efficiency. When the
genuine jaundice, says he attacks a
child rarely how it is too often
fatal with whatever propriety or
energy we may attempt to relieve it.
It is generally recommended to
commence the cure with an Emetic
for this we have the authority of
Armstrong, Underwood, Burns &c, to
oppose this single experience
against this might seem ill judged
if not rash, yet we dare not run
counter to our own observations"

Maunsell & Evinson

especially as we have given fair trial (in our own estimation) of the remedy and the result is decidedly against the practice. Emetics have not only failed in our hands to remove the disorder, but rendered the stomach so irritable as not to receive any other remedy willingly. We have therefore abandoned them for some years and find we can succeed by another plan of cure".

Underwood is of opinion the mother is capable of communicating jaundice to the infant if she is at the time suffering from the disorder herself, and although in such cases most of the physiological effects will be produced, still it is shown not to be a true jaundice by the fact that its feces are of a normal colour, and we need not be surprised that the child does not get well (that is loose its yellow colour) until the mother or nurse is cured and the child weaned, since it is constantly receiving the same coloured milk.

There is one other peculiar fact connected with these cases, which is the tendency which this disease has to occur, either in a mild or in a more fatal form in all the children of one mother, which is well illustrated by the following case related by Pearson -

Mrs. J. had been the mother of eleven children, or nine of which the Jaundice had appeared a few days after they were born, and they all died within the period of a month after their birth. The tenth child lived six years, was then afflicted with Jaundice and then died In May 1796 Mrs. J. was delivered of the Eleventh child; on the same third day after its birth, the skin became yellow, and the child at the same time was remarkably torpid and sleepy and seemed to be slightly convulsed: On the following days the colour of the skin often varied, being sometimes of a deep yellow, and at others regaining its natural colour - The child continued however in the same

languid and almost insensible state, but received nourishment and sucked the breast of its mother, till within a few days of death, which took place on the ninth day. I opened the body of this child the day after death and shall now describe the appearances on dissection.

"The skin had almost lost its yellow colour, and the child did not appear at all reduced by the disease. The liver was almost twice its natural size; the whole concave surface of the right lobe had a livid appearance but this dark colour did not penetrate but a line or two, and the internal surface was sound and healthy. The convex part of the liver was of a natural colour and firmness, except on the margin of both the lobes; there the thin edge exhibited a highly injected appearance; the redness was however less livid and remarkable on the left lobe than on the right. There was a slight adhesion of the lower part of the right lobe to the peritoneum. The gall bladder was

nearly filled with bile of a deep yellow colour and its ducts were permeable. The heart seemed to be larger than common, and the Woodwards on its surface were remarkably traced. The right auricle was distended with blood, and the pericardium contained about a tablespoonful of water".

Cases sometimes occur where the child is born jaundiced, or where that symptom becomes developed immediately after birth, and such cases on examination after death have turned out to be a non development of the gallbladder or its ducts or a non closure of the ductus venosus.

The peculiarity of such cases is that the child can have been so long passed without the elimination of the poison circulating in the vessels, in fact such an occurrence seems almost to us impossible, and the bile must therefore be got rid of by being given off to the maternal blood in the placental Circulation. In such cases there is no very frequent and painful symptom which occurs and

Charles Evans

which very often leads to a fatal issue, before the life has developed its poisonous effects; this is the occurrence of Umbilical Hemorrhage, the cause of which seems still to be a matter of some doubt but we presume it arises principally from the distended and congested condition of the liver to which such an obstruction must give rise, the bile not now being eliminated as we presume through the medium of the natural circulation but accumulated in the ducts of the liver.

There would appear however another way in which this may be produced, namely by a congestion with a cessation of the functions of the organ whereby the fibrinine is produced and the ducts to relieve itself of its superabundance by pouring forth the blood from the umbilical vein, the passage of which has not yet become obliterated; of which the following case may be quoted as an example

May 10th. G. H's daughter five days old was remarkably stout and

healthy when born, but on the third day after birth her skin became jaundiced. she took the breast very well before last night, when from measles she ceased to suck but she has returned to the breast again she appears to be very well in every respect but that her colour is jaundiced and she has occasional fits of pain. May 18th. The skin continues fully as deep as it was and the child is becoming soft and emaciated. her stools are white and like putty. her bowels have been kept open by a daily injection of Senna; but urine stains the linen very deeply. she sucks freely. May 21st

There is no change in the jaundice, her stools and urine are much like what they were; last night she had a slight bleeding from the umbilicus, and she is gradually getting weaker

May 23rd. Although the ligature fell off on the tenth day from birth there was a great hemorrhage from the umbilicus, and the child died

This morning in consequence of the
P.M. upon opening the body the
first thing done was to examine the
state of the vessels of the umbilical
cord. The vein was found empty, and
such a probe readily passed from
the navel into the vein. The arteries
were also found open. The intestines
had no degree of transparency but
were of a milky colour, tinged with
a delicate yellow from the bile in
their coats, not in their cavity.
The stomach was very much distended
the glands of the intestines were larger
than they should be and white
compared with those of the adult.
The liver was full and firm, and of a
dark green earthy colour. The gall
bladder was quite empty and contracted
so that it had sunk into the substance
of the liver, and only a small part
of its fundus appeared. within it
there was a small hard mass of a dark
colour, like, and of the size of a
grain of barley. The ducts also were
contracted, firm, white, and like an
artery, and although previous entrance

no bile, the opening into the duct was perfectly free to the probe. When the liver was cut into this appearance of the fineness of the ducts was still discernable.

In a late review of a new work by M Senac, it would appear that this disease has been divided by him into Five Classes instead of three as we have done in the foregoing pages, but from a careful perusal of that article we have come to the conclusion that such a division is unnecessary and may easily be enclosed within the bounds we have given.

With regard to the first two of his classes the difference appears founded on the "icteroid" coloration not being of a true saffron-yellow hue, but rather of a "raw Sienna" tone with a slight dash of green in it, or in some cases when deep in intensity it is of a dirty orange tint, the conjunctiva is free from coloration and the urine does not contain any of the elements of bile, while in the second class the skin is at first of a light

yellow hue, and gradually increases in depth, until it has a Saffron like appearance, and the evacuations assume similar shades, and the urine stains the napkin yellow, but in neither does any constitutional disturbance exist, by which they are distinguished from the third class, together with a constipated condition of the bowels, but such a minute division we think it unnecessary to make as the two latter are only evidently the same condition in different degrees of intensity and the result of the presence of bile in the evacuations, which there is no evidence that the former can be traced to such a cause —

In like manner we presume we may include in our second class the Fourth of Dr Denis which is characterized as follows.

"At any time within the first week of life but mostly within the last half of it, symptoms of cholera-infantum appear in the child with marked disturbance (changing in character)

of the digestive organs. Soon a jaundice hue pervades the skin and is accompanied from the beginning by diarrhoea, abdominal tension or even signs of acute and intense enteritis, or the jaundice is associated with haemorrhage from the umbilical cord, or its seat or with phlebitis of the umbilical vessels, or with pyaemia, and which carries off the little patient. In other cases what has been termed, rather absurdly, 'malignant hepatitis', coexists with the icterus, or the latter complicates sclerema, or is in union with severe muguet, erysipelas erythriasis, pleurisy or atelectasis". All of which we consider more as accidental concomitants than as the real cause of the disease.

In the fifth and last class are included those cases of congenital malformations of which we have already spoken.