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STATISTICAL AND PATHOLOGICAL OBSERVATIONS ON SOME ALTERED CONDITIONS OF THE LIVER.

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There is, perhaps, no organ in the human body which displays such varied appearances in bulk, weight, and colour, as does the liver, even outwardly; and assuredly there are none that, upon section, exhibit such special differences in colour, apparent arrangement of texture, and also in consistence, as this important organ does. These varieties are sometimes so distinctly marked, that the inexperienced necrotomist may be led to suppose he has fallen upon some new disease, and its consequent morbid alteration, on each occasion of his inspecting a fresh variety of physical form and appearances. Many of these changes, easily recognized by the eye of the artist, and manifest also to the discerning pathologist, may be declared to be within the limits of mere physiological change—the more prominent characters of which have been a good deal influenced by concomitant diseases, and the mode and crisis of death. These abnormal alterations, confined as they mostly, at first, are, to the vascular texture of the organ, and perfectly within the pale of recovery and rectification, if recognized during life, yet very gradually are found to merge into fixed and irrecoverable heterologous structure, as we may inferentially judge from the nature and results of such morbid actions in other organs of the body, as well as in the liver.

In the absence of special deposits, these changes obtain primarily in the different classes of blood-vessels, in biliary ducts, or in what are called the *acini* or *lobuli*—the seat of the biliary apparatus; or the change may occur even in the hepatic cells themselves, of which these so termed *lobuli* are composed. It is not often easy to meet with a liver that may be considered a perfect type of a truly healthy and normal one, as it exists in the living human body, as the great vascularity of the organ makes it very liable to oscillatory movements, and to various states of repletion of its sanguineous fluids—from its near proximity to the stomach and intestines, whence it directly draws a great deal of its supply, and from the organ itself being easily influenced by any stasis or remora between it and the heart and great caval veins. We have, therefore, on *post-mortem* inspections, a variety of well marked appearances, simply depending on *hyperæmia*, or

anæmia, in the respective classes of vessels—the repletion affecting the hepatic veins and *anæmia* the portal capillaries in one instance, while in another case the converse may be observed, though more rarely. There may be also vascular turgescence or *anæmia* in both in comparison with the *lobuli*; while these last, or the whitish part, may be atrophied or unduly developed, as we find in the livers of those whose digestive organs have been well supplied with stimulating food and drink.

To discriminate more correctly the initial morbid changes in the liver, the anatomy and physiology of the organ require to be more intimately studied and known than they have yet been. Though much research has of late years been directed to these important objects, yet the exact mode of coalescence or anastomosis between the extremities of the portal vein and of the hepatic artery, is not yet quite agreed upon, or how far they both or each independently contribute to the biliary secretion; and, moreover, how this secretion is performed, whether always in ducts, as the urine is in the kidneys, or by the conveyance through, or transmission of cells, from the centres of the *lobuli* to their peripheries, there to be deposited in the biliary ducts.

All these recondite and very interesting objects, with some others relating to the function of the liver, yet remain to challenge the investigation of the microscopist and anatomist, so that we may be more enabled to discriminate diseases, and to propound more soundly our therapeutic indications.

The various appearances and conditions of the liver to which we have adverted, though recognized by several pathologists during their casual and relative observations on hepatic diseases, were of late considered by me as worthy of statistical attention, to ascertain in what proportions their more general alterations might exist in the course of my observations, for nearly the period of twelve months, at the Union Hospital.

These observations at first were instituted principally with the view of determining the average number of *margined* or fatty livers that occur on inspection of those who die with phthisis, in order to form some comparison with the statistical results of Louis on this subject. I, moreover, perceived that some other alterations in this organ might as well be noted during the course of our researches and consecutive inspections, as they appeared interesting and of pathological importance. In this class of additional observations, the average weight of the organ was ascertained—its outward appearance, colour, and shape, were noted in each case,

and on section the colour and consistence were likewise tabulated, and especially that class of blood-vessels in which *hyperæmia* or *anæmia* was most observable, along with the degree of development or aggregation of the biliary lobuli. In most, and, I may say, in nearly all the instances, portions of sections of the liver were submitted to the microscope to verify the condition of the cells, whether they were normal, more or less hypertrophied, diffuent, or dissolved, and in what apparent proportion the oil ovules existed, and if these appeared in any the least undue proportion, a certain weight of the liver was forthwith submitted to analysis, to separate and ascertain the percentage of the margarine in the whole organ.

Fifty cases were thus examined successively, with occasional intermissions, and tabulated, along with any morbid appearances or alterations that were remarked in the associated organs, or more distant parts of the body; but as these, except those in the lungs, have little connection with the object of this paper, they will at present receive no farther notice.

As my observations are therefore limited to these fifty cases, this review will not be disturbed by what has been previously observed, or on other occasions remarked by me in the same field; nor will much reference be made to what has been observed by Drs. Farre, Baillie, Andral, Louis, Hope, and lately by Dr. Budd, on the same subject.

It may well be supposed that out of the number of instances thus examined, many livers would be found, if not healthy, at least within the pale of what we may term normal oscillation, and so they were. When we also take into consideration the circumstances in which many of the persons examined had lived during the latter periods of their lives, we may also predicate that not many of the livers would be found greatly engorged, phlogosed, nor much hypertrophied, and so it was. No case of truly inflamed nor suppurated liver came under notice, and only one case of malignant disease, namely, cancerous tubera; though hydatids and scrofulous tubercles imbedded beneath the surface of the organ have been at times observed.

Several anomalous conditions and diseases of the gall-bladder and its contents have been also remarked—such as extreme distension of its cavity, entire collapse or obliteration of it, thickening of its coats, and also calculi of biliary matter, as well as some large ones of cholesterine.

I may also mention, that in the livers of several females we had occasion to remark the effects of pressure, long continued by the ribs on the upper and dextral surface of the organ, from the deep and parallel sulci or grooves imprinted on it—shewing, that in the lowest condition of life, a straight and compressed waist does not cease to be an object of desire and perseverance to obtain, if we may judge from the effects produced.

I shall now proceed to give a synopsis of the observations made on these fifty instances of inspections of the liver, in reference to *sex*, *age*, *weight* of the organ; its *vascular* and *glandular condition*; and, lastly, the *fatty degeneration*, or what I would call *margarosis* of the liver.

1st. *As to sex*—of the fifty instances enumerated, twenty-three were males and twenty-seven were

females. How far these proportions represent the near ratios in which deaths or necropsies of the sexes take place at the Hospital, I cannot, at present, say—they are only those which I had the opportunity or time, without selection, to examine.

2nd. *Age*.—The average age of the whole cases was 37.4 year; the youngest, a male, was fifteen years of age; and the oldest, a female, was seventy-five.

3rd. *Weight*.—The average weight of the liver was found to be 3 lbs. 11 oz. 4 drs., averdupois; the maximum in one case, a female, amounted to 7 lbs. 12 oz., while the minimum was as low as 2 lbs., in another female, aged forty-four years.

There is no organ in the body which presents such variety in weight and bulk as the liver, even when there is no change in it of a truly morbid or organic nature. The supply of food, the nature of employment, the circumstances during life, along with the powers or voracity of the absorbing and assimilating functions, greatly influence the size and development of this important gland in all its textures. The weight of the liver is, besides, not always correspondent to its size. Firm livers, with much interstitial and albuminous deposit, as in some cases of granulated or cirrhotic liver, are weighty in proportion to their bulk; while others, affected with much *margarosis*, are light in comparison with their size. Indeed, from the relative specific gravities, a fair conclusion may be deduced of the amount of fatty or oily matter existing in the organ, as has been ingeniously done in many instances by Dr. Francis, to whom I owe several obligations for his aid in these and similar researches. I have found, in one instance of this adventitious deposit, that sections of it had, from their buoyancy in water, nearly the same specific gravity as that fluid.

4th. *The Vascular Conditions*.—In remarking on these several conditions of the liver, it is necessary to advert to the more minute structure of the organ, as it, of late years, has been described by Dr. Kiernan and Mr. Bowman, and which has been verified by other observers. Keeping in view, then, that the capillaries of the portal vein and hepatic artery with the biliary ducts, are distributed around and through a variable space of the exterior part of the area, of what are called the *lobuli* or *acini*, and that the capillaries of the hepatic vein are distributed in the interior part, and converge to a central vein, we shall be enabled to appreciate the *plus* and *minus* states of these separate classes of vessels. It is needful, also, to advert to the hepatic cells, which are placed in the inter-capillary area of all these vessels, which, moreover, have a more or less free anastomosis with each other through the intermediate area of this cellular structure. The cells themselves are in form irregularly spherical and oblong; they seem to have no visible envelope, and though Mr. Bowman has figured a distinct *nucleus* and a *nucleolus* in each, I have not often been able to see them, but generally granules and oil ovules, with a power of 160 diameters. These cells have been observed in several of the cases examined, from either poverty or cachexia of the blood, to become diffuse, lose their definite outline, or to be entirely broken down. At other times they have appeared more firm, and, as it were, hypertrophied. This hypertrophy, in one case, seemed to have been the initial stage of tuberculous deposit, which became developed into all the features

of occult carcinoma. In another case the hypertrophy seemed the basis of organic granulation.

Having thus such elemental structures all combined together, we may easily see how repletion or hypertrophy in one or more of them may be attended or compensated by *anæmia* or atrophy in another. Thus we may have hyperæmia in the central vein connected with the hepatic—giving an undue extension to the vascular redness of the interior of the lobuli, while the portal capillaries are exanguine, and the peripheries of the lobuli pressed together, and this happens more frequently where there has been any obstruction to the circulation in the large caval veins, or in right side of the heart.

Again, hyperæmia has been observed but less frequently, in the inter-lobular or portal capillaries, while the intra-lobular or hepatic ones have been anæmiated—giving a more diffused redness to the organ on section, and by compression of the white part of the lobuli into beadlike lines and curves, an appearance arises somewhat similar to the wavy mixture of colour in a section of a nutmeg. This repleted state of the portal capillaries is generally owing to either a too great fullness or nutrition in the portal system, and undue *vis a tergo*, or else to obstruction in the glandular lobuli themselves. This hyperæmia even prevails so far as almost to render invisible, with the naked eye, the central or hepatic vein; but when seen it is only in the form of a *punctum*, which was not recognized by Dr. Hope in these cases, as the empty and compressed central vein.

An exaggeration or chronic state of this relative hyperæmia seems to tend to organic and fixed change—giving rise to the effusion of interstitial lymph, and condensation of the once elastic lobuli, from which results that permanent change, commonly called nutmeg-liver. This change has by some been reckoned a distinct disease, by others an hypertrophy of the white substance. In its advanced stage, it certainly has the appearance of something special about it, but its initial condition seems to consist only of a want of balance between the powers and contents of the afferent and efferent vessels. In reports of myristicated liver, it would be desirable, in many instances, if observers would simply state the relative appearances, instead of using an arbitrary term, which has so little definite meaning with many.

The proportions in which these two species of hyperæmia were found to obtain to each other, in well marked characters, were sixteen of hyperæmia of the central and hepatic vein and its capillaries to ten cases of a similar condition in the interlobular or portal capillaries, making twenty-six cases out of the fifty; the remaining twenty-four exhibiting either a normal condition of both classes of vessels, or some other more notable alteration of the organ.

Glandular Condition of the Liver.—Independently of the vascular state of the respective blood-vessels of the organ to which I have adverted, it appeared, during the progress of these researches, that the cell-structure also underwent several alterations. In the majority, the biliary cells appeared of uniform size and development, being filled with granules, and generally with a few minute oil ovules. In a few others, however, the cells were not so easily recognised, they appeared more diffuent, and, as it were, dissolved down—owing either to a want of tonicity in the organ during life, or to

speedy metamorphosis after death. Indeed, if good inspections of the hepatic cells be wanted, they should be submitted to the microscope, as soon after death as possible, as I have found that they soon lose their defined outline from early decomposition; for next to the kidney, and perhaps the brain, no organ sooner yields to innate resolution of its textures than the liver.

In two or three cases of what are called granulated or cirrhotic liver, I found that hypertrophy of the lobuli seemed to be the initial stage of these alterations, along with the atrophy of the vascular apparatus. Bouillaud, with whom Dr. Hope agrees, believes also that the granulations are not a new or accidental tissue; and certainly, as far as the microscope reveals, the same aspect and texture are observed in them as in healthy liver, only there seems to be an exaggeration of the cell-structure. In the advanced stages of declared cirrhosis, there seems to be an augmentation of granular matter, with less definiteness of the respective cells, and this probably may arise from an adventitious deposit of albumen leading to impaction of the secretory elements—and so more or less to obstruction of the sanguineous circulation, by which those serous effusions into the abdomen are promoted, which we see so often to attend these conditions of the liver.

To illustrate the foregoing *vascular* and *glandular* conditions, several correct coloured drawings, taken immediately after section, were exhibited, but which the nature of the Journal will not admit of publication along with the paper.

(To be continued.)

CASE OF SANGUINEOUS APOPLEXY IN A CHILD.

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Acute primary apoplexy in children is considered an unfrequent occurrence. The majority of authors state the period between 40 and 70 as that in which it is most common. M. Rochoux found in sixty-three cases, attended with extravasation of blood into the substance of the brain, that two only were between 20 and 30, the remainder from 30 to 80 years of age. Dr. Copland, in his "Dictionary of Practical Medicine," states, never having met with true hæmorrhagic apoplexy at an earlier age than 18. Of the numerous cases recorded by Dr. Abercrombie, one only is said to have taken place at 18, and one at 9; the latter was considered remarkable from the period of life at which the affection took place. The appearances after death are thus described:—The lateral ventricles contained coagulated blood; that in the right, was the size of a large walnut, the other smaller; the third and fourth were also filled with blood in a firm state. The spinal cord was enveloped with a stratum of blood throughout its whole extent.

Rilliet and Barthez, whose attention has been especially directed to this subject, look upon cerebral and ventricular apoplexy as a rare disease among children, and when it does happen, as either accompanied or followed by symptoms altogether unusual at a more advanced age. It is seldom met with in an acute or