Dr. Emil Holmgren and the liver cell / by E.A. Schäfer.

Abdruck aus:
Anatomischer Anzeiger.
Centralblatt für die gesamte wissenschaftliche Anatomie.
Amtliches Organ der Anatomischen Gesellschaft.
Verlag von **Gustav Fischer** in **Jena.**
XXIII. Band, No. 1, 1903.

Dr. Emil Holmgren and the Liver Cell.

By E. A. Schäfer, Edinburgh.

In the Anatomischer Anzeiger, Bd. 21, p. 483 Dr. E. Holmgren, referring to the so-called "Schäfersche Präparate" of liver — a phrase for which it appears to me "Simpsonsche Präparate" might appropriately be substituted — endeavours to explain the appearances which these preparations exhibit by supposing them to be artefacts resulting from an interstitial extravasation of the injection-material between the liver cells and the vascular wall; which material has thence forced its way into the cell protoplasm. His actual words are as follows: "Gegen Browicz bin ich jedoch sehr im Zweifel, ob wirklich hierbei natürliche Bildungen vorliegen. Meinerseits bin ich vielmehr sehr geneigt, anzunehmen, daß Schäfer infolge einer gewaltsamen Injektion allerlei Kunstprodukte vor sich gehabt hat". And in a more recent paper in this Journal (Bd. 22, p. 315, 316) he expresses himself in somewhat similar terms.

In support of this opinion Dr. Holmgren reproduces a drawing from one of these preparations, which drawing according to him shows such an extravasation lying in a space between the vascular wall and the adjacent liver cells and communicating with varicose canals within the cells (but not with the interior of the blood-vessel). Whilst I do not deny that small extravasations are here and there to be found in these preparations — they are indeed always readily produced in making injections of liver — nor indeed did I omit to mention the circumstance in my original description of the preparations, I have nevertheless pointed out[1]) and must here again insist upon the fact that it is precisely in the neighbourhood of extravasations that the injection of the intracellular canaliculi fails or is incomplete while it is quite perfect in all other parts of the preparation. In my opinion Dr. Holmgren has misinterpreted the appearances which he has delineated. From a careful examination of similar specimens I am convinced that the clear line which he has described as the capillary wall and which shows no structure, is nothing but a cleft produced by the shrinkage of the gelatine under the action of the alcohol used for hardening and dehydrating the specimen; and that what he looks upon as extravascular extravasation is a part of the mass which has adhered to the wall of the vessel from which the more central part has shrunk away. Such appearances are common in gelatine-injected preparations where, as in the liver, the capillaries are prevented from following the shrinkage of the

1) Anat. Anz., Bd. 21, p. 19.

gelatine by reason of their close adhesion to the surrounding cells. But in many parts of these preparations the gelatine has shrunk away from the wall as a whole leaving no external line of colouring matter such as is represented by Dr. HOLMGREN, and in these parts the intracellular canals are just as fully injected as elsewhere. Nor is there in the liver so far as my own observations go (and in this matter I entirely agree with Professor BROWICZ) any space between blood-capillaries and liver-cells, the cells being in the closest possible apposition to the walls of the vessels [1]). Moreover extravasations due to escape of the injection-mass from the blood-vessels do not take the form described by HOLMGREN but appear as irregular masses excavating their way between the liver-cells and sending no offsets whatever into the interior of the cells.

That the canaliculi shown in the preparations described by me are artefacts is a supposition which I should have supposed could not be entertained for a moment by any experienced histologist. They are well defined anastomosing passages which form a network *within nearly every cell throughout the whole liver*. The injection material which fills them is of the same intense colour as that within the blood-capillaries and appears at places to be connected with this by fine threads. That it has not passed into the cells by way of the lymphatics appears evident from the fact that such injection material as is found in the lymphatics, e. g. in those of the portal canals, is of a far paler tint than the material within the blood-vessels and intracellular canaliculi; the result, as I suppose, of dilution with lymph. From these evidences the most probable explanation seemed and still seems to me that the injection has passed directly from the interior of the capillaries into the intracellular canaliculi by means of pre-existent communications [2]). I do not deny the *possibility* that the injection might first pass into perivascular lymphatic clefts (assuming that such clefts really exist; an assumption which is, to say the least, open to considerable doubt); there is no clear evidence of its having done so and, moreover, on this hypothesis it would be still more difficult to understand why it should have passed into the interior of the cells in so extraordinarily complete a manner throughout the whole organ as is seen in these preparations, rather than having made its escape by way of the efferent lymphatics.

Remarkable as this injection from the blood-vessels of intracellular canaliculi at first sight appears it must be borne in mind that the

---

1) This is nowhere more clearly shown than in a figure given by Dr. HOLMGREN himself (see this Journal, Bd. 22, p. 10).

2) I regret that in my first communication (loc. cit. p. 20) I represented Professor BROWICZ as agreeing with me that the preparations indicate a *direct* communication between the vessels and liver-cells, whereas Professor BROWICZ speaks of it as *indirect*. But the actual difference between our views seems to me far less than is indicated by these terms.

observation is not unique. Long ago ASP noticed appearances in injected preparations which showed that in some way or another the injection material used by him penetrated from the blood-vessels into the interior of the liver-cells, and the brothers FRASER[1]) were, later, able in the frog to inject passages within the liver-cells communicating directly with the blood-vessels. Nor do the preparations which I have described come only from one liver but from two, and in both cases the whole liver is equally injected, almost every cell in the organ exhibiting the anastomosing canaliculi filled with the material which had been used for injecting the blood-vessels.

With regard to the fact of the existence of these canals and of the possibility of injecting them from the blood-vessels there is not and cannot be a shadow of doubt. As Professor BROWICZ truly says "the injection appearances are nothing less than ideal" (Anat. Anz., Bd. 22, p. 161). But as to the exact meaning of the fact each person who sees the specimens will naturally exercise his own judgment, especially as regards the manner in which the canaliculi have become filled with injection and it would indeed seem from what has already appeared in print upon the subject that the old adage "Quot homines, tot sententiae" is as applicable to this as to most other questions of interpretation. No one therefore can blame Dr. HOLMGREN if he puts upon the appearances in dispute a meaning which fits in best with the ideas he has formed regarding the structure of secreting cells. But Dr. HOLMGREN has raised a question of an entirely different nature, viz: is it justifiable to publish an observation relating to a matter of fact if the interpretation of the fact be difficult or if the fact itself seems to ride counter to received opinions upon the subject? I gather at least from his remark — "Ich stimme mit dem hingeschiedenen Professor RUTHERFORD vollkommen überein" (i. e. in his refusal to permit Dr. CARLIER to describe the preparations) that in his opinion Professor CARLIER in desiring to publish this observation and I in having, with Professor CARLIER's permission, ultimately published it have been guilty of a grave error of judgment; and that, seeing that the observation was difficult to reconcile with current ideas regarding the structure of the liver-cell and its relation to the hepatic capillaries, we should have acted more wisely if we had agreed to suppress its publication. I venture to believe, however, that on this question of ethics there will not be found many to agree with Dr. HOLMGREN.

---

1) Journ. Anat. and Physiol., Vol. 29, p. 240, 1895.