RESULTS

After the three histological techniques (Masson's trichrome, Orcein and Gomori's reticulin), it was found that, the stroma of the pancreas consisted of a well defined capsule, from which partitions of connective tissue extended to divide the pancreas into lobules. Within the lobules, the pancreatic ducts and blood vessels were enveloped by connective tissue, the acini were packed together in a most irregular way, with little reticular tissue in between and some fibers could be seen around and inside the islets of Langerhans. There was no difference between the both sexes.

(1) After Masson's Trichrome Stain

Group [1]

The surface of the pancreas was covered with a relatively thin layer of collagenous fibers which were running parallel to the surface and gave rise to thin interlobular septa (Fig. 1).

The pancreatic ducts were surrounded by a thin layer of collagenous fibers which was deficient at certain points (Fig. 2).

Islets of Langerhans showed no detectable fibers at all.

Fig.(1) A photomicrograph of a section in th pancreas of an albino rat (one day) showing a relatively thin layer of collagenous fibers extending along the surface(Masson's trichrome, X Proj.:10 X Obj.: 40)

Fig.(2) A photomicrograph of a section in the pancreas of an albino rat (one day) showing a thin layer of collagen fibers surrounding the pancreatic duct (arrows) (Masson's trichrome,X Proj.: 10 X Obj.:40)

Group [2]

The collagenous fibers at the capsule and around the pancreatic ducts were more prominent than those present in the group 1.

Group [3]

The collagenous fibers formed a well organised capsule extending along the surface and gave rise to a well formed interlobular septa (Fig. 3).

The pancreatic ducts were surrounded by complete layers of collagenous fibers which were condensed at certain points and loosley arranged at others (Fig. 4).

No collagenous fibers could be detected in the islets of Langerhans, but those seen either at the periphery or inside were surrounding blood vessels (Fig. 5).

Group [4]

The surface of pancreas was covered by a well formed, more prominent and thick capsule. Two different layers could be distinguished, an outer condensed layer and an inner loose one which continued with the interlobular septa. The outer surface of the capsule was covered by a thin layer of peritoneum which was not detected

Fig.(3): A photomicrograph of a section in the pancreas of an albino rat (3 months) showing a relatively thick layer of collagnenous fibers extending along the surface and inbetween the lobules (Masson's trichrome, X Proj.: 10 X Obj.: 40)

Fig.(4): A photomicrograph of a section in the pancreas of an albino rat (3 months) showing a complete layer of collagenous fibers surrounding the pancreatic duct (arrows) (Masson's trichrome, X Proj.:10 X Obj.: 40)

Fig.(5): A photomicrograph of a section in the pancreas of an albino rat (3 months) showing an islet of Langerhans with thick collagenous bundles surrounding large blood vessels (Masson's trichrome, X Proj.:10 X Obj.:40).

at the younger ages (Fig. 6).

The pancreatic ducts were surrounded by a layer of collagenous fibers which was more thicker than those seen at adult age (Fig. 7).

Some collagenous fibers started to appear at the periphery of the islets of Langerhans and extended in between their cells (Fig. 8).

Group [5]

The collagenous fibers formed a thick capsule with the same characters as seen at six months but more thicker. Blood vessels were sometimes detected in the inner layer (Fig. 9).

The pancreatic ducts were surrounded by a more thicker layer of collagenous fibers than those seen at the younger ages (Fig. 10).

Collagenous fibers became more prominent at the periphery of the islets and in between their cells (Fig. 11).

II- **After Orcein Stain**

Group [1]

The thickness of the network at the surface and the condensation of elastic fibers around the blood

Fig.(6) A photomicrograph of a section in the pancreas of an albino rat (six months) showing a thick layer of collagenous fibers extending along the surface and inbetween the lobules.
Note the peritoneal covering on the outer surface (arrow) (Masson's trichrome,X Proj.:10 X Obj.:40)

Fig.(7) A photomicrograph of a section in the pancreas of an albino rat(six months) showing a thick layer of collagenous fibers around the pancreatic duct (Masson's trichrome, X Proj.:10 X Obj.:40)

Fig.(10): A photomicrograph of a section in the pancreas of an albino rat (one year) showing a thick and condensed layer of collagenous fibers around a pancreatic duct and a prominent interlobular septum (Masson's trichrome,X Proj.:10 X Obj.:40)

Fig.(11): A photomicrograph of a section in the pancreas of an albino rat (one year) showing some collagenous fibers extending to the periphery of an islet and between its cells (Masson's trichrome, X Proj.: 10 X Obj.:40)

vessels and pancreatic ducts were less marked (Figs. 12,13).

No elastic fibers could be detected either around the islets or in between their cells.

Group [2]

The distribution of the elastic fibers was the same as in the adult age. However, the thickness of the network at the surface and the condensation of the fibers around the ducts were more than those detected at one day (Figs. 14, 15).

No elastic fibers could be detected in the islets of Langerhans.

Group [3]

Elastic fibers, in the capsule, were thin, short branched and anastomosing with each other to form a network running along the superficial layer of the capsule. However, the deep part showed no elastic network (Fig. 16).

No elastic fibers could be detected in between the acini as they were confined to the wall of the blood vessels and around the pancreatic ducts (Fig. 17).

Fig.(12): A photomicrograph of a section in the pancreas of an albino rat (one day) showing a prominent network of elastic fibers running along the surface.
Note the absence of the elastic fibers in the deep capsular layers (arrows) (Orcein stain, X Proj.: 10 X Obj.:40)

Fig.(13): A photomicrograph of a section in the pancreas of an albino rat (one day) showing a thin layer of E.F. around a pancreatic duct (arrows)(Orcein stain, X Proj.:10 X Obj.:40)

Fig. (14): A photomicrograph of a section in the pancreas of an albino rat (one month) showing a network of elastic fibers running along the surface (arrow). No elastic fibers could be detected inbetween the acini (Orcein stain, X Proj.: 10 X Obj.: 40)

Fig.(15) :A photomicrograph of a section in the pancreas of an albino rat (one month) showing a prominent and a relatively thick layer of E.F. around a pancreatic duct (Orcein stain,X Proj.:10 X Obj.40)

Fig.(16): A photomicrograph of a section in the pancreas of an albino rat (three months) showing a prominent, thick network of elastic fibers (E.F.) running along the surface (Orcein stain, X Proj.:10 X Objc.:40).

Fig.(17): A photomicrograph of a section in the pancreas of an albino rat (three months) showing a prominent layer of E.F. around a pancreatic duct (Orcein stain, X Proj.:10 X Obj.:40).

Islets of Langerhans showed no elastic fibers at all either at the periphery or inside.

Group [4]

Elastic fibers in the capsule were arranged in one prominent layer instead of the network observed at the previous ages (Fig. 18).

The pancreatic ducts and blood vessels were surrounded by a thin layer of elastic fibers but less than those seen at the previous ages.

Elastic fibers could not be detected in the islets of Langerhans.

Group [5]

No elastic fibers could be detected at the surface or in the islets of Langerhans.

A very thin layer of elastic fibers was detected around pancreatic ducts. Its thickness was more or less similar to that seen at one day (Fig. 19).

III- <u>After Gomori's Reticulin</u>

Group [1]

The reticular fibers in the capsule, interlobular septa and around the pancreatic ducts were prominent

Fig.(18): A photomicrograph of a section in the pancreas of an albino rat (six months) showing a thin layer of E.F. running along the surface.
Note the presence of scarce and attenuated E.F. inbetwen the fibers of the deep layer of the capsule (arrow) (Orcein stain, X Proj.: 10 X Obj.: 40).

Fig.(19): A photomicrograph of a section in the pancrease of an albino rat (one year) showing a thin layer of E.F. around the ducts (arrows)(Orcein stain, X Proj.: 10 X Obj.:40).

and thick (Figs. 20, 21).

Islets of Langerhans were covered by thick layers of reticular fibers separating them completely from surrounding acini. Some reticular fibers were found inside the islets (Fig. 22).

Group [2]

The distribution and thickness of reticular fibers in the capsule, around the ducts and islets were more or less similar to the adult age.

Group [3]

Reticular fibers were detected in the capsule and extended in the interlobular septa. Each acinus was completely surrounded with reticular fibers (Fig. 23).

The pancreatic ducts were completely surrounded with a relatively thick layer of reticular fibers (Fig. 24).

Reticular fibers formed a well defined capsule completely surrounding the islets of Langerhans. Some reticular fibers were seen scattering inside the islets (Fig. 25).

Groups [4] and [5]

The thickness of the reticular fibers was markedly

Fig.(20): A photomicrograph of a section in the pancreas of an albino rat (one day) showing a relatively thick, well formed capsule of R.F. (arrows).

Note that the fibers in the network are more prominent. (Gomori's reticulin, X Proj.:10 X Obj.:40)

Fig.(21): A photomicrograph of a section in the pancreas of an albino rat (one day) showing a prominent layer of R.F. around a duct (arrows) (Gomori's reticulin, X Proj.: 10 X Obj.:40)

Fig.(22) A photomicrograph of a section in the pancreas of an albino rat (one day) showing a thick complete capsule of R.F. around an islet.
Note that some R.F. are present inside the islet around its blood vessels (arrows) (Gomori's reticulin, X Proj.:10 X Obj:40).

Fig.(23): A Photomicrograph of a section in the pancrease of an albino rat (three months) showing a well defined capsule of reticualr fibers (R.F.) Note that the interlobular and intralobular R.F. are present in connection with each other forming a network (arrows). (Gomori's reticulin, X Proj.:10 X Obj.:40).

Fig.(24): A phogomicrograph of a section in the pancreas of an albino rat (three months) showing a relatively thick layer of reticular fibers around a pancreatic duct (arrows) (Gomori's reticulin, X Proj.:10 X Obj.:40)

Fig.(25): A photomicrograph of a section in the pancreas of an albino rat (three months) showing a well defined capsule of R.F. completely surrounding an islet.
Note the presence of some R.F. inside the islet (arrows) (Gomori's reticulin, X Proj.:10 X Obj. : 40).

reduced than the previous ages to form a very thin layer in the capsule interlobular septa, around ducts and islets (Figs. 26, 27, 28).

Fig.(26): A photomicrograph of a section in the pancreas of an albino rat (one year) showing a thin capsule (arrow) and very thin layers of R.F. between the acini (Gomori's reticulin, X Proj.:10 X Obj.:40)

DISCUSSION

The present study revealed that the collagenous fibers in the capsule, interlobula septa and around panceatic ducts inceased gradually in amount to become more apparent and evident with advancing age . In contrast to this the reticular fibers decreased grandually with age. These resutls coincide with the results previously postulated by Arey (1971) and Ross and Reith (1985) who stated that as the time goes on, a part of reticular fibers takes on collagenous fibers characteristics but, some, however, remain permanently at the reticular stage.

The presence of collagenous fibers around the islets and inbetween their cells in the advanced age may explain some cases of senile diabetes. Fibrosis of such islets was described by Maclean (1959) and Andreson and Thomas(1980) as a possibility following diabetes. It varies from slight changes where a minor degree of fibrosis of exocrine pancreatic tissue may occur with some involvement of islets to a complete replacement of the islets by dense collagenous

fibers. As well Shalaby (1984) stated that after induction of diabetes with alloxan the collagenous fibers started to increase gradually around the ducts and the blood vessels. Such fibrosis increases with increasing the dose of alloxan.

The present observation showed that, elastic fibers increased gradually with age at the surface of the pancrease, around blood vessels and pancreatic ducts to reach a maximum at adult age (three months) This result, is in agreement with those obtained by Enan(1981),may be explained by what was mentioned by Nada (1983) who stated that the high elastic content of the capsule at adult age might be essential to withstand pressure provoked by the adjacent organs of the pancreas which might be of importance for the evacuation of the exocrine parenchymatous segments that were devoid of contractile elements.

The gradual decline in the elastic content during senility could be explained by the fact that, elastic fibers loose their resiliency as elastin degenerates into elacin with advancing age (Arey,1971).