sels very little matter is added to the internal layer, perhaps none, and hence no dot or canal is apparent in them (Pl. XI, Div. 2, fig. *d*).

The spiral and sinuous direction of the fibres of the secondary layer is very easily recognizable, at least when punctated vessels are carefully examined; but the attention of the observer should be strongly directed to it, as the brighter appearance of the punctations themselves, from the light only passing through a less thickened layer of membrane, draws more powerful consideration to them. It may also be well observed when a vessel is cut, or when it breaks itself at the side (as at fig. *f*).

The section of a completely formed punctation is seen at Pl. XI, Div. 2, fig. *g*; the dotted line indicates the primary membrane, the broader dark line beneath it, the fibre.

It will be seen that we thus differ from Mohl in believing that a secondarily formed fibrous layer, consisting of filaments bent upon themselves, is mainly instrumental in the formation of punctations, and agree with him in the circumstance of the depression being caused by a sinking-in of the primary membrane, but which latter condition never could exist without the previous existence of the fibres alluded to. We also consider the fibres or filaments not to be of primary development, and not to serve in this particular as a support to Dr. Barry, in what we have thought to be his views. (Figs. *a*, and *b*, are from Meyen.)

XXXIX.—MICROSCOPICAL OBSERVATIONS ON THE PATHOLOGICAL MORPHOLOGY OF SOME OF THE ANIMAL FLUIDS, BY DAVID GRUBY, M.D.—
No 4.

Translated from the Latin by S. J. Goodfellow, M.D., &c.

[Continued from page 272.]

THE following are the tables shewing the characteristic properties of the different fluids, referred to at page 262 of our last number :—

RESULTS.

A.—OF MUCUS.

Healthy mucus and mucus generated by irritation and normal inflammation, are composed of an amorphous ductile substance (proper mucus) globules, and epithelium.

HEALTHY MUCUS.	MUCUS PRODUCED BY NORMAL IRRITATION.	MUCUS PRODUCED BY SLIGHT NORMAL INFLAMMATION.	MUCUS PRODUCED BY A MORE INTENSE NORMAL INFLAMMATION.	MUCUS PRODUCED FROM CHRONIC NOEAL INFLAMMATION.
Very few globules Much of an amorphous substance (proper mucus) Contains but little epithelium Globules from 2—4 times larger than the blood particles No molecules, or the smallest, fill the globules Very thin envelope to the globules Not changed in water	Very few globules Very much of proper mucus Contains but little of epithelium Globules from 4—5 times larger than the blood particles The smallest molecules fill the globules Very thin smooth envelope Globules swell in distilled water	Globules more numerous Less mucus Contains more epithelium Globules 6—8 times larger than the blood particles The smallest molecules (filled with), and a central vesicle Smooth envelope Swell in distilled water Envelopes easily broken in water	Globules very numerous Much less mucus Contains very little epithelium Globules from 6—8 times larger than the blood particles Filled with the smallest molecules and a central vesicle Smooth envelope Globules swell in distilled water Envelopes easily broken	Globules very abundant Very little mucus Contains very little epithelium, Globules 6—8 times larger than the blood particles Filled with the smallest molecules and a central vesicle Smooth or no envelope Swell in distilled water Envelopes easily broken

MUCUS PRODUCED FROM SPECIFIC OR ANOMALOUS INFLAMMATION CONTAINS, BESIDES SUBSTANCES PECULIAR TO NORMAL MUCUS, OTHER FORMS.

MUCUS GENERATED FROM TUBERCULOUS INFLAMMATION OF THE LUNGS.	DYSENTERIC MUCUS.	MUCUS OF URETHRAL BLENNORRHOEA.
Besides the products of catarrhal inflammation contains yellow lenticular spheres 1—8 times larger than the globules of pus, concentrically striated, composed of concentric lamellæ, which are dissolved in caustic potash. In nitric acid — solution of nitrate of silver Some pulmonary cells and muscular fibres are seen in it.	Contains globules with central vesicles and molecules, round or ovate greenish corpuscles endowed with the smallest molecules, symmetrically disposed, and also products of catarrhal inflammation They are increased } 5 times in volume & become transparent } — solution of nitrate of silver	Contains from the beginning a very few globules exceeding four times the diameter of the particles of the blood and provided with the smallest molecules and an envelope On the third day it is composed of many globules, the smallest molecules, an envelope, and central vesicle On the tenth day <i>all</i> the vesicles are endowed with central vesicles They swell and are easily broken in water On the fortieth day very few globules are found

B.—OF PUS.

Pus is composed of a certain white pellucid fluid and globules; sometimes other substances are mixed with these.
 PUS GENERATED BY NORMAL INFLAMMATION.

PUS FROM A RECENT WOUND.	PUS FROM A RECENT ABSCESS.	PUS FROM AN OLD ABSCESS.	PUS FROM AN OLD WOUND.	PUS FROM THE SURFACE OF AN ORGAN WHOSE CONTINUITY IS UNINJURED.
Few globules Contains more fluid Globules from 4—6 times larger than those of the blood With very small, and larger molecules Have one central vesicle and an envelope Globules swell, and envelope bursts in distilled water	Many globules Contains but little fluid Globules 3—4 times larger than those of the blood With very small, and larger molecules One or two central vesicles, seldom without one Globules swell, and envelope broken in distilled water	Many globules Contains but little fluid Globules 3—4 times larger than those of the blood With very small, and larger molecules With a central vesicle Swell but little in distilled water	Few globules But little fluid Globules 3—4 times larger than those of the blood Contains a good deal of epithelium With very small, and larger molecules No central vesicle Does not swell in distilled water	Few globules Much fluid Globules 6—8 times larger than those of the blood Contains but little epithelium With very small, and larger molecules or none Composed of a central vesicle full of molecules, or none at all in it Sometimes swell in distilled water

PUS FROM SPECIFIC INFLAMMATION.

I. GENERATED DURING THE VARIOUS PROCESS.			2. GENERATED IN THE TUBERCULOUS PROCESS.
A.—DURING THE FORMATION OF PAPULE.	B.—DURING THE FORMATION OF VESICLES.	C.—DURING THE FORMATION OF PUSTULES.	See—Mucus produced from Specific Inflammation.
<p>The pellucid fluid extricated offers an alkaline re-action Is composed of a white pellucid fluid and a few free molecules of the larger and smallest kind, and animalcules On the third day after the eruption larger molecules and a few white almost pellucid globules 2—3 times larger than those of the blood Filled with the smallest molecules Molecular motion scarcely to be seen Animalcula are found in it</p>	<p>On the 4th day a little limped serum Contains globules endowed with the smallest and larger molecules, and a central vesicle The envelopes are not easily broken Vehement molecular motion Animalcules, and free very small globules On the 5th day the turbid serum has an alkaline re-action Contains globules of the larger yellow molecules The envelopes are easily broken The molecular motion and animalcules are well seen</p>	<p>On the 6th day the thicker yellow fluid has but a slight alkaline re-action The globules 4 times larger than those of the blood, many with an envelope easily to be broken, or without one Filled with the smallest or the larger molecules, and sometimes provided with a central vesicle The molecular motion diminished On the 7th day and beyond, the yellow thick fluid contains many globules adhering together The envelopes are very easily broken, the molecules dissipated without order Cells of epithelium and drops of fat are frequently seen in it</p>	

C.—OF SEROUS EXUDATION.

WHITE, OR GREENISH-WHITE, LIMPID, EXUDATED, SEROUS FLUID IS COMPOSED OF A PELLUCID FLUID AND GLOBULES.

SEROUS EXUDATION OF A BLADDER PRO- DUCED BY A BLIS- TER.	SEROUS EXUDATION FROM CRUDE INFIL- TRATION OF INTES- TINAL TYPHUS.	SEROUS EXUDATION EXTRICATED FROM THE PAPULÆ OF MO- DIFIED VARIOLA.	SEROUS EXUDATION EXTRACTED FROM THE FIBRINE OF A VILLOUS HEART.	SEROUS EXUDATION FROM A HYDRO- CYST.	SEROUS EXUDATION FROM OEDEMA OF THE CUTIS.	SEROUS EXUDATION EXTRACTED FROM THE SUBSTANCE OF AN INFLAMED HU- MAN PLACENTA.	SEROUS EXUDATION FROM THE VAGINAL DISCHARGE ON THE THIRD PERIOD OF PREGNANCY.
Contains white glo- bules with a very thin covering filled with the smallest molecules or desti- tute of all cover- ing 1—2 larger than the blood globules	Contains white glo- bules with an en- velope filled with the smallest mole- cules 1—2 larger than the blood globules	Contains white glo- bules with a very thin covering filled with the smallest molecules 1—4 times larger than the blood glo- bules	Contains white glo- bules, consisting of a very thin enve- lope, filled with the smallest molecules 1—2 times larger than those of the blood	Contains perfectly round white glo- bules destitute of molecules Scarcely larger than the globules of the blood	Contains white, or yellowish - white stellated globules, scarcely larger than those of the blood Here and there pro- vided with a small nucleus	Contains white glo- bules, with an en- velope filled with the smallest mole- cules 1—2 times larger than those of the blood	Contains white glo- bules, with an en- velope filled with the smallest mole- cules Once to twice larger than the blood- discs

D.—THE MORPHOLOGY OF THE GLOBULES GENERATED DURING THE PATHOLOGICAL PROCESS.

1. THOSE WHICH OCCUR IN MUCOUS MEMBRANE.

IN HEALTHY MUCOUS MEMBRANE.	IN IRRITATED MUCOUS MEMBRANE.	IN SLIGHTLY IRRITATED MUCOUS MEMBRANE.	IN A MORE INTENSE INFLAMMATION OF MUCOUS MEMBRANE.	IN CHRONIC INFLAMMATION OF A MUCOUS MEMBRANE.
Very few yellowish-white globules are generated, provided with a covering, and enclosing none or very few of the smaller molecules. They are not changed in water, and are from 2—4 times larger than those of the blood	Very few yellowish-white globules are generated. They are provided with an envelope, enclosing the smallest molecules, and are 4 times larger than the blood globules, and swell in water	More copious or abundant yellowish-white globules are generated. They are provided with an envelope, filled with the smallest molecules and a central vesicle, and swell, and are broken in water. They are 8 times larger than the blood globules	The yellow globules are generated in greater abundance, 8 times larger than the blood globules, endowed with an envelope, filled with the smallest molecules, and a central vesicle. They swell, and are broken, in water	The yellow globules are generated in the greatest abundance, are 8 times larger than the blood globules, endowed with an envelope, or an envelope with the smallest molecules, and a central vesicle

2. THOSE WHICH ARE GENERATED IN THE SKIN.

BY THE APPLICATION OF A BLISTER.	BY THE VARIOUS PROCESS UNDER THE FORMATION OF PAFULE.	BY THE VARIOUS PROCESS DURING THE FORMATION OF VESICLES.	BY THE VARIOUS PROCESS DURING THE FORMATION OF FUSTULES.	BY THE VARIOUS PROCESS DURING THE FORMATION OF CRUSTS.
A very few white globules, 2—3 times larger than the blood globules, endowed with no envelope, or one filled with the smallest molecules. Water does not change them	A very few white globules, 2—3 times larger than those of the blood, pellucid, endowed with a very thin covering, enclosing the smallest molecules. They swell in water	Numerous yellowish-white globules, 3—4 times larger than those of the blood, endowed with an envelope, filled with the smallest and larger molecules, and a central vesicle. They swell, and are broken, in the water	Very numerous yellow globules, 4—5 times larger than those of the blood, provided with the smallest and larger molecules, and the central vesicle. They swell in water, and are easily broken	A few yellow whole globules, 4—5 times larger than those of the blood: many lacerated, furnished with no envelope, or with one filled with the different molecules. They are easily broken

3. THOSE WHICH ARE GENERATED IN SEROUS MEMBRANE.

HYDROCYSTS.	OF THE PERICARDIUM UNDER THE FORMATION OF THE VILLOUS HEART.	OF AN INFLAMED PERITONEUM.	OF AN INFLAMED PERITONEUM NEONATI.	OF A VERY ACUTELY INFLAMED PERITONEUM.
White, pellucid, perfectly round globules are formed, scarcely larger than those of the blood, with an envelope destitute of all molecules. They are not changed in water	White globules, 2—3 times larger than those of the blood, endowed with a very thin envelope, filled with the smallest molecules. They swell in water	Yellowish-white globules, 3—6 times larger than those of the blood, formed with an envelope, filled with the smallest and larger molecules. They swell in water	Yellowish-white globules, 4—8 times larger than those of the blood, composed of a very fine envelope, with a few very small molecules or none, and with a central vesicle, either filled with the smallest molecules, or possessing none. They are not changed by water.	Yellow globules, 4—8 times larger than those of the blood, either with a very thin envelope partly or entirely filled with the smallest or larger molecules, or with no envelope. They are not changed by water

OF CRUDE, RECENT INFILTRATION OF THE LIUM.	OF THE RED INFILTRATED MESENTERIC GLANDS IN ABDOMINAL TYPUS.	IN THE PROCESS OF PURULENT INFILTRATION OF THE CELLULAR TISSUE.	IN THE SOFTENED MESENTERIC GLANDS IN ABDOMINAL TYPUS.
The globules are white diaphanous scarcely exceeding the diameter of the blood globules, with a smooth envelope filled with the smallest molecules They swell but little in water	Yellowish white diaphanous globules exceeding from 2—4 the globules of the blood composed of an envelope filled with the smallest molecules or 6 times larger than those of the blood with an envelope filled with the smallest molecules and a central vesicle are many molecules	Round yellowish white globules, exceeding 4 times the magnitude of those of the blood, composed of an envelope filled with the smallest molecules They swell but little in water	Round yellowish white globules 4—8 times larger than those of the blood composed of an envelope with the smallest or larger molecules They swell in water
OF A BEPATIZED RECENT PLACENTA.	OF A BEPATIZED RECENT SPLEEN.	IN THE EXUDATION OF PLASTIC LYMPH IN CROUP.	
White globules scarcely exceeding those of the blood composed of an envelope, filled with the smallest molecules	White globules equalling in magnitude the globules of the blood, or twice as large, with or without an envelope, but if with one, it is filled with the smallest molecules They are not changed by water	Round yellowish white globules exceeding 3 or 4 times the size of those of the blood, composed of an envelope filled with very small molecules They are not changed by water	
THOSE WHICH ARE GENERATED ON THE SURFACE OF A PATHOLOGICAL (DISEASED) ORGAN.			
EXPOSED.			
IN THE TENTH HOUR OF A RECENT WOUND.	OF PUS OF A RECENT WOUND 24 HOURS AND BEYOND.	OF PUS IN THE SEVENTH WEEK OF A RECENT WOUND.	FROM AN OLD WOUND SUPPURATING BUT LITTLE.
A few round, white, transparent globules 1—3 times larger than those of the blood composed of a very thin envelope filled with the smallest molecules They swell but little in water	Round yellowish white abundant globules 4—6 times larger than those of the blood, endowed with a very thin envelope with the smallest and the larger molecules, and also a central vesicle. They swell in water	Very numerous round yellowish globules 5—8 times larger than those of the blood, composed of an envelope with the smallest molecules and a central vesicle. They swell and their envelopes are broken in water	A few yellow roundish globules 2—4 times larger than those of the blood, composed of a dense envelope full of the smallest molecules They are not changed by water
SHUT.			
ABSCESSES IDIOPATHICI RECENTISSIMI PRELI ABDOMINALIS.	OF IDIOPATHIC ABSCESS OF THE LIVER.	OF AN OLD IDIOPATHIC ABSCESS.	OF A METASTATIC ABSCESS OF 6 DAYS STANDING.
Round or oblong yellow globules 4—6 times larger than those of the blood composed of a very thin envelope, with the very small and larger molecules, either with or without a central vesicle, or a simple or double one They swell in water and their envelopes burst	Round yellow globules 3—4 times larger than those of the blood composed of a thin envelope full of the larger and a few of the largest molecules They are changed but little in water	Yellow round globules 4—6 times larger than those of the blood composed of a very thin envelope, endowed with the smallest molecules: some have no envelope They swell in water	Round globules 1—3 times larger than those of the blood, composed of the smallest molecules, but seldom of an envelope Are not changed by water

COMPARISON BETWEEN MUCUS AND PUS GENERATED FROM NORMAL INFLAMMATION.

FORM OF THE GLOBULES.	MAGNITUDE.	COLOUR.	ENVELOPE.	CENTRAL VESICLE.	MOLECULES.	DISTILLED WATER.	ACETIC ACID.	OXALIC ACID.	TARTARIC ACID.	NITRIC ACID.	MURIATIC ACID.	SOLUTION OF THE NITRATE OF SILVER.	CONCENTRATED SOL. OF NITRATE OF SILVER.	PURE AMMONIA.	LIME WATER.	PURE POTASH.	SPIRITS OF WINE.
Round or oblong	3-4 times larger than those of the blood	White or yellow	Smooth or none at all	Single or double	The very small and the larger	Envelopes are broken	Dis- solves the en- velopes and the very small mole- cules. — The nuclei 1-6 re- main clearly to be seen	Dis- solves the en- velopes and the very small mole- cules.	Quick- ly dis- solves the en- velopes, the white vesicle remain- ing	Corru- gates the en- velopes	Corru- gates the en- velopes	Corru- gates the glo- bules, and tinges them a yellow colour	First dis- solves the glo- bules, and the very small mole- cules and nu- clei	No change	No change	Dis- solves the glo- bules; the white mucous fluid re- mains	Con- tracts the glo- bules
							No change produced	No change produced	No change produced	Forms fila- ments	Forms fila- ments	Forms fila- ments	Forms fila- ments, which are more slowly dissolved in it	No change	No change		
Round or oblong	3-4 times longer than those of the blood	White or yellow	Smooth or none at all	One or two, seldom none	The very small and the larger	Enve- lopes are broken	Dis- solves the en- velopes, the 2-5 nuclei remain	Dis- solves the en- velopes, the 2-5 nuclei remain	Very quickly dissolves the en- velopes	Corru- gates the en- velopes	Corru- gates the en- velopes	Corru- gates the glo- bules, and tinges them a yellow colour	Readers the glo- bules, transpa- rent, the contract- ed nu- cleus re- maining	No change	No change	Dis- solves the glo- bules, and the mu- cous fluid re- from 1-5	Con- tracts the glo- bules, and forms nuclei
							Pro- duces no change	Pro- duces no change	Pro- duces no change	Forms no fila-	Forms no fila-	Forms no fila-	Forms no fila-				

1. Of Globules.

2. Of the thick pellucid
dentile fluid.
3. Of Epithelium.1. Of Globules.
2. Of a pellucid
fluid.
3. Of Epithelium.