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ARTICLE XXIV.

FIRST REPORT TO THE "COTTON PLANTERS' CONVENTION" OF GEORGIA.

[CONTINUED.]

Chemical Analysis of Shell Marl, Hickman county, Kentucky. *

Water, - - -	1.35	The insoluble Silicates consisted of—	
Organic Matter, soluble in			
Water, - - -	0.30	Silica, - - -	60.6
Insoluble Silicates, -	73.30	Alumina, - - -	7.4
Carbonic Acid, -	10.00	Lime, - - -	1.1
Lime, - - -	6.80	Loss, Alkalies and a trace of	
Magnesia, - - -	3.78	Oxide of Iron, not estimated,	3.8
Alumina and Peroxide of			
Iron, - - -	2.80		
Chlorine, - - -	0.12		73.3
Loss, Alkalies and Phosphoric Acid not determined, - - -	1.55		
	<hr/> 100.00		

* By Dr. David Dale Owen. Loc. Cit. p. 27.

TABLE 11.—Chemical Constitution of the Limestones and Marls of Alabama, according to Profs. Toumey and Mallet.*

LOCALITY AND NAMES.	Carbonate of Lime,....	Carbonate of Magnesia,	Silicates,.....	Alumina,.....	Oxide of Iron,.....	Phosphoric Acid,.....	Silica, Soluble in Acid,	Potassa,.....	Phosphate of Lime,...	Specific Gravity,.....
METAMORPHIC AND SILURIAN LIMESTONE.										
Talladega County Marble,..	99.47	0.38	trace							2.712
Marble, Talladega County,.	35.67	2.51	61.15	0.39						2.761
Grey Compact Marble, Talladega County,.....	96.22	0.66	2.79	trace	0.20					2.711
Greyish Limestone, Big Sandy Creek,.....	96.37	1.72	1.04	trace	0.25					3.717
Dark Grey, Crystalline Limestone, Talladega County,.	90.43	4.23	4.30	trace	0.74	trace				2.698
Dark Compact Limestone, Shelby County,.....	90.52	4.93	4.36	trace	0.49					2.717
White Crystalline Limestone, Talladega County,.....	55.48	44.04	0.09	trace	0.31					2.846
White Marble, Macon Co.,.	55.07	43.95	0.40	trace	0.19					2.885
Crystalline Limestone, do do	54.57	42.94	1.39	trace	0.26					2.865
White Crystalline Limestone Macon County,.....	59.33	37.93	5.05	trace	2.24					2.833
Compact Greyish Limestone Macon County,.....	59.33	35.39	1.81	trace	0.33					2.860
Greyish Limestone, do do..	56.07	41.84	1.64	trace	1.04					2.845
Blue-Grey Limestone, do do	55.16	44.32	0.79	trace	0.44					2.844
Brownish White Limestone, Jones's Valley,.....	54.62	40.13	4.64	trace	0.80					2.617
Yellowish Grey, Crystalline Limestone, Chockoloch.,.	55.17	43.39	0.45	trace	0.89					2.853
Dark Bluish Grey, Oxford,	51.48	34.32	10.55	0.47	3.05					2.847
CARBONIFEROUS LIMESTONES.										
Greyish Brown Limestone, Huntsville,.....	64.03	1.76	31.91	trace	2.03	trace				2.676
Blueish Grey Granular Limestone, Tennessee River,...	92.17	0.61	5.57	0.32	0.79	trace				2.702
Cream Colored Limestone, Franklin Co., near Athens,	99.21	0.39	0.39	trace	trace					2.592
Limestone with Encrinites, Maple Creek,.....	54.25	0.34	43.44	0.24	1.21	trace				2.641
Stone containing Bones of Fossil Fish, Cowpens Creek,.....	16.41	trace	63.28	trace	0.36	6.31	0.44		1.419	
CRETACEOUS LIMESTONES.										
Shell Conglom'rate, Macon Co	53.66	0.97	44.60	0.27	0.22					
Fossiliferous Limestone, Macon County,.....	88.82	2.18	7.20		0.94	0.24				
Fossiliferous Limestone, Macon County,.....	46.96	1.19	50.61	trace	0.78	0.26				2.649
Dark Grey Limestone, Macon County,.....	51.92	0.61	45.71	trace	1.60			trace		2.611
Rotten or Prairie Limestone, Demopolis,.....	75.07	0.72	21.16	0.79	1.44	0.20	0.14	0.094	0.40	1.976
Rotten Limestone, Cahawba,	64.37	0.79	30.44	0.75	2.19	0.25	0.59	5.041	0.54	1.923
Rotten Limestone, Green County,.....	80.48	0.53	13.09	0.98	1.24	0.17	0.19	0.113	0.30	2.064

*Second Biennial Report on the Geology of Alabama, by M. Toumey, A. M. Edited by Prof. Mallet.

TABLE 11.—Chemical Constitution of the Limestones and Marls of Alabama, continued.

LOCALITIES AND NAMES	Carbonate of Lime,....	Carbonate of Magnesia,	Phosphoric Acid,.....	Peroxide of Iron,	Alumina,.....	Chlorine,.....	Silica,.....	Potassa,.....	Silicates,.....	Specific Gravity,.....
TERTIARY LIMESTONE AND MARLS.										
Brownish Yellow Limestone, Clarke County,.....	93.84	0.96		1.81	0.31	tree			1.67	2.569
Cream Colored, Limestone or Marl, Clarke County,...	94.85	1.57	0.31	0.27	tree	"			2.44	2.151
Shell Conglomerate, Clarke County,.....	93.19	1.09		1.03	0.26	"		trace	4.15	
Alabama Green Sand, Coal Bluff, Alabama River,....	0.91	1.35		20.93	6.70		57.82	4.81		2.297
Alabama Green Sand, Coal Bluff, Alabama River,....	1.18	2.05		19.34	6.42		57.28	4.95		2.297
Alabama Green Sand, Coal Bluff, Alabama River,....	1.04	1.70		20.13	6.56		57.56	4.88		
Alabama Green Sand, Coal Bluff, Alabama River,....	0.71	0.87		19.24	5.43		58.91	4.48		
Alabama Green Sand, Coal Bluff, Alabama River,....	0.92	1.48		21.06	4.71		58.74	3.26		2.249
Alabama Green Sand Marl, Coal Bluff,.....	29.33		1.003					1.673		
New Jersey Green Sand, Concretionary Mass of Fossil Shells, Railroad Cut, near Columbus, Ga.,.....	0.43	0.27		23.72	5.76		50.99	10.07		
Bluish Green Marl, Troy, Pike County,.....	70.84	trace	0.103	0.04	1.94		0.21		26.26	
Marl, Bluish Green, Chattahoochee River,.....	21.42	0.16	trace	2.88	0.15	"			75.08	
Marl, Bluish Green, Below Eufaula,.....	25.87	0.31	trace	3.23	0.94	"			63.71	
Yellowish Brown Marl, Camden,	13.47	1.01	0.176	3.21	1.08		0.54		79.14	
	23.18	trace	0.057	3.35	0.32		0.30		72.06	

TABLE 12.—Composition of Green Sand from the United States and of the Green Earth of Europe.

	Alabama, according to Prof. Mallet,	Alabama, according to Prof. Mallet,	Alabama, according to Prof. Mallet,	Alabama, according to Prof. Mallet,	Scotland, according to Thom- son,	Germany, according to Berthe- n,	New Jersey, according to Prof. Rogers,	Martha's Vineyard, according to Dr. L. S. Dana,
Silica,	58.91	57.56	57.28	57.83	48.16	46.1	48.45	56.700
Alumina,	5.48	6.56	6.42	6.70	16.85	5.5	6.30	13.320
Protoxide of Iron,	19.24	20.13	19.34	30.93	19.00	19.6	24.31	20.100
Potash,	4.58	4.88	4.95	4.81	6.56	5.3	12.01	
Magnesia,	0.87	1.70	2.05	1.35	2.91	3.8		1.176
Lime,	0.71	1.04	1.18	0.91	2.67		trace	1.624
Water,	8.17	8.17	8.17	8.17	2.35	8.9	8.40	7.000
Quartz,					11.5			

The Green earth of Europe appears to have resulted from the decomposition of Trap, as it is found occupying cavities in trap rocks; and it is highly probable that the Green Sands of America have resulted from the decomposition of the Trap dykes found along the Atlantic slope, from New Jersey to Alabama. This being the origin of the Green Sand and Green Earth, we have every reason to believe that it will be found in Georgia. If it should be found in large quantities it will prove an invaluable fertilizer to the Planters of Georgia, on account of the large proportion of Potash which it contains. We shall show hereafter that Potash enters largely into the composition of Cotton, Corn, and in fact, of all plants and animals.

The careful comparison of the results, of the chemical examination of 394 specimens of Limestones and Marls from various parts of Europe and America recorded in the preceding tables establishes the following conclusions.

1. The Shell Limestone of Georgia, is richer in Lime and contains less impurities than the majority of the Limestones and Marls of Europe and of the United States and is fully equal to the best Limestones and Marls found in Europe and America.

2. The Shell Limestone of Georgia is capable of furnishing lime for architectural purposes, equal in purity and in quality to any in Europe or in America.

3. The Shell Limestone of Georgia is more suitable for agricultural purposes than the Limestones of the older formations in Europe and in America, in two most important respects.

(a) It contains less Magnesia.

(b) It contains a much larger proportion of the phosphates.

In the Limestones of the older formations, Phosphoric Acid, and its compounds are either absent or exist in such minute portions, that when employed in agriculture the effects produced by the phosphates must be unimportant.

In the Shell Limestone of Georgia on the other hand, the Phosphates exist in from $\frac{1}{3}$ to 2 per cent. and will exert decided beneficial effects upon vegetation. If we calculate the quantity of Phosphate of Lime, contained in the number of bushels of Shell Limestone which should be applied to each acre of land, we will find that it will amount to several hundred pounds; and in fact to a greater quantity than that which we are accustomed to add to each acre of land, in the form of most expensive, "super Phosphates" and Phosphatic Guanos, whose value depend almost entirely upon the Phosphates which they contain.

The establishment of this result is of the highest value to the State of Georgia; for we have thus demonstrated, that Georgia possesses inexhaustible stores of the Phosphates which are considered by agriculturists to be amongst the most valuable fertilizers.

4. The Marls of Georgia are as rich in Carbonate of Lime as the Marls of Europe, and of other portions of the United States.

5. The Marls of Georgia are richer in Phosphoric Acid and its compounds, than the majority of the Marls of Europe and of other parts of the United States, and are fully equal to the richest Marls of Maryland, South Carolina and Alabama.

One of the beds of Georgia Marl yielded near seven per cent. of Phosphate of Lime, and would give to the 300 bushels more than one thousand pounds of Phosphate of Lime. Several of the analyses of the Marls of Maryland and South Carolina, show a higher per cent. of Phosphate of Lime, than those of Georgia; but I find upon reference to the accompanying description, that the specimens were selected from deposits rich in bones, and excrements of fish, and fragments of Corals. I have in my possession bones and Coprolites from the Shell-Limestone and Marl-beds of Georgia which would yield a higher percentage of Phosphates, even than those of Maryland and South Carolina; but they have been excluded from my present tables, that the analyses now presented, might faithfully present the average composition of the Eocene Lime formation of Georgia.

In the Marls, then, as well as in the Shell Limestone, Georgia possesses, inexhaustible stores of Phosphate of Lime.

We may, then with truth affirm that in this important element of fertility Georgia is independent of the world.

6. The Marls from different localities vary in Chemical constitution within wide limits, some deposits are rich in Carbonate of Lime, others in Phosphate of Lime, and others again in Organic matters.

This diversity is highly important in an agricultural and commercial point of view.

It is a fact well established, that the application of Marls to the soil, should be guided by the constitution of the Marl and of the soil. This diversity in the Chemical constitution of the Marls and Shell Limestone of Georgia allows of latitude in the choice of fertilizing agents for the different varieties of land.

This diversity in Chemical constitution of the Marls and Shell-Limestone of different localities, demonstrates the importance of careful Chemical Analyses of all the varieties of Marl and shell limestone in Georgia.

The great importance and value to the State, of a careful and extended chemical examination of the Marls and Shell Limestone of Georgia will be still farther illustrated by the valuable results obtained in Europe by similar examinations.

In the lower Chalk beds of Sussex and some of the Southern counties of England, extensive layers of a yellowish brown earth have been discovered to be exceedingly rich in Phosphoric Acid.

According to the careful Analysis of Th. J. Herapath,* it possessed in the 100 parts the following constituents:

Carbonate of Lime	- - - - -	28.400
Carbonate of Magnesia	- - - - -	traces.
Sulphate of Lime	- - - - -	0.736
Tribasic Phosphate of Lime,	} Phosphoric Acid - Lime - - -	10.098
21.880.		11.790
Phosphate of Magnesia	- - - - -	traces
Phosphate of Sesquioxide of Iron,	} Phosphoric Acid Iron - - -	11.728
24.760.		13.032
Phosphate of Manganese	- - - - -	traces.
Phosphate of Alumina,	} Phosphoric Acid - Alumina - - -	4.789
6.998.		2.209
Fluoride of Calcium	- - - - -	traces.
Organic Matters	- - - - -	traces.
Silica, with some silicate of Alumina and Silicate of Iron.	- - - - -	13.240
Chloride of Sodium	- - - - -	traces.
Sulphate of Soda,	. . . . .	traces.
Water	. . . . .	3.400
Loss	. . . . .	0.586

In every hundred parts of this earth there are found 26,615 parts of Phosphoric Acid.

The Coprolites from various parts of England, have also been proved by Chemical Analysis to be rich in Phosphoric Acid, and, when obtained in sufficient quantities, have proved most valuable fertilizers.

*Chem. Gaz. 1849.70 Liebig and Kopps Annual Report on Chemistry, Vol. 3. 1849, p. 584.

The following Analysis of Coprolites by Herapath will illustrate their general constitution.

TABLE 13.—100 PARTS CONTAINED.

	Coprolite from the coast of Suffolk, weighing 700 grs. sp. gr 2.815.....	Coprolite from the coast of Suffolk.....	Coprolite from the lias bed of Lyme Regis, weight 9 oz
Carbonate of Lime.....	12.280	39.50	23.70
Phosphate of Lime....	7.09	15.86	60.80
Phosphate of Magnesia.....	traces	.....	.....
Phosphate of Alumina.....	6.90	4.71	.....
Phosphate of Sesquioxide of Iron.....	1 60	9.20	4.10
Carbonate of Magnesia.....	traces.	0.50	.....
Sulphate of Lime.....	traces.	.....	1.8
Fluoride of Calcium.....	0.608	1.700	.....
Silicic Acid.....	5.792	10.660	1.6
Water and Organic Matters.....	0.400	11.600	6.10
Alumina.....	.....	6.200	.....

In England various Marls, petrifications and bodies resembling Coprolites, and Phosphoric Acid concretions have been discovered in the chalk formation to be rich in Phosphoric acid, and are extensively employed as manure.

The results of the careful examinations of these strata by J. M. Paine and J. T. Way, demonstrate that the Phosphates are differently distributed through the Strata composing the same formation, and that the proportion of Phosphoric Acid and of the combinations of Phosphoric Acid do not correspond in any definite manner with the proportions of Carbonate of Lime.

Thus, careful experiments upon these strata in the Chalk formation, show that the soft white chalk with flint, forming the upper division of the formation contains 96.06 per cent. of carbonate of Lime, and only 0.26 per cent of phosphate of Lime; the second division, the hard white Chalk without flint, contains no Phosphoric Acid; the third division the Chalky Marl, contains 66.69 per cent. of Carbonate

of Lime, and 1.82 per cent of Phosphoric Acid, being much poorer in Carbonate of Lime, and much richer in Phosphoric Acid, than the upper division; while the upper Green Sand is far richer than the other divisions in Phosphoric Acid, yielding in some parts especially in its upper thin layer of Marl (in depth from a few inches to 10 to 15 feet) which contains numberless fossils, as much as 33 per cent. of Phosphoric Acid.

The soil surrounding these formations rich in Phosphoric Acid, does not contain an unusual amount of Phosphoric Acid except when the fossils, and the formations have been mixed with the soil, or when the soil has resulted from the disintegration of the former.

The following results of the experiments of J. M. Paine and J. T. Way* will illustrate these important facts :

*Liebig and Kopps Report on Chemistry &c. Vol. 3 p. 584-585.

TABLE 14—Chemical Composition of some of the divisions of the Chalk formation of England; showing the distribution of Phosphoric Acid and the Phosphates and fossils.

NAME, STRATA AND CHARACTER OF CHALK AND MARL.	Phosphoric Acid....	Lime	Carbonic Acid.....	Magnesia	Aumina and Oxide of Iron.....	Potassa	Soda.....	Insoluble Silica.....	Soluble Silicic Acid.	Sulphuric Acid.....	Water Organic mat. and Hydrofluoric Acid	Total.....
Chalky Marl, 3d division.....	1.82	37.71	28.98	0.68	3.04			19.64	6.45			98.32
Upper Green Sand, upper layer of Marl. A branched Aleyonite. There is also in it a large amount of Amorphous Spongiform bodies, from 8 to 10 pounds weight, containing from 5 to 50 per cent of Phosphate of Lime, the amount of which, increases however from without inwards.....	29.87	42.29	8.77		6.87			7.68	3.28		4.52	100.0
Upper Green Sand, upper layer of Marl Soft. Shapeless body containing fossils.....	27.13	39.85	8.77	0.96	10.60			7.18			2.49	100.26
Green Sand, upper layer of Marl, sifted from the fossils.. Upper Green Sand, Hardened Marl and little fossils which re- main on the sieve.....	9.61	9.53	2.61	1.97	11.46			32.81			3.02	
Upper Green Sand, Marl from Bentley with the fossils.	9.31	15.24	2.35	1.43	13.11	3.10		26.83	29.14		2.64	99.94
Green Sand. The fossils from the Marl from Bentley.....	6.89	9.11	4.52	1.64	13.55			39.59	26.30		4.12	97.21
The Gault, the Second Division of the Green Sand.....	33.03	46.50	5.58	trace	1.96			7.12	18.42		3.04	100.50
Lower Green Sand after pounding and removal of the principal petrifications.....	24.28	47.46	12.43	0.21	2.91			0.91	3.27		11.80	100.00
Lower Green Sand. The petrifications.....	0.64	2.01	5.64	0.18	5.58			75.46	8.12		2.30	99.94
Lower Green Sand Green Grains.....	20.80	23.86	1.06	0.37	3.35			43.87	3.25		3.44	100.00
	20.65	34.61	4.01		8.22	1.79	1.87	18.53		5.13	2.28	97.09

We have every reason to believe that an extended and careful examination of the Calcareous deposits of Georgia, will lead to similar results.

Whilst the Marls and Shell Limestone thus far discovered during this agricultural survey of the State of Georgia, are amply sufficient for all the agricultural wants of Georgia, and if properly developed and used will not only reclaim her worn-out lands, but preserve them in their primitive fertility for untold generations, still the discovery of beds rich in the Phosphates would be of great value to the State, for at the same rates of transportation, a much more valuable article would be obtained, and an active commerce in these native fertilizers might be established.

IV.—*Comparison of the Shell Limestone and Marls of Georgia, with various Commercial Manures.*

It is of the greatest importance, that the relative value of the native resources of Georgia should be carefully determined by an impartial comparison with the most reliable Fertilizers offered in the American market; for the value of the native products should control the price of the manufactured and imported manures. Whilst we would not intentionally injure any honest manufacturer or vender of Fertilizers, we would on the other hand, do all in our power to develop the resources of our native State, and use every fair means to protect the Planters of Georgia in the purchase of Fertilizers, and prevent the ruinous drain of money which flows out of the State, without any other return than worthless compounds, foisted into public notice by false and brazen advertisements.

We will commence the comparison with those Fertilizers, which I have examined since my appointment as Chemist to the Cotton Planter's Convention, of Georgia.

1.—RHODES SUPER-PHOSPHATE OF LIME.—This article is manufactured in Baltimore, Md. It is but just that I should state to the Convention that both the manufacturers and venders of this Fertilizer, have thrown open everything to my examination, and have manifested a determination to conduct all their operations in an open and strictly honest manner.

Samples of Rhodes Super-Phosphate, selected by myself on the 14th of April, from the entire stock of Messrs. J. A. Ansley & Co., Commission Merchants, Augusta, Ga., yielded the following average results.

ANALYSIS 14. RHODES' SUPER-PHOSPHATE FROM AUGUSTA.

	1 Ton of 2,000 pounds contain pounds	1,000 pounds contain pounds.....	400 pounds contain pounds	300 pounds contain pounds	200 pounds contain pounds	100 pounds contain pounds,	100 parts contain....
Free Trihydrated Phosphoric Acid } 1.98 } Water,.....	28.80	14.40	5.76	4.32	2.88	1.44	1.44
Soluble Phosphate of Lime, } 14.76 } Metaphosphate of Lime, } 12.50 } Phosphoric Acid, } Water,.....	10.80	5.40	2.16	1.62	1.08	0.54	0.54
	175.60	87.80	35.12	26.34	17.56	8.78	8.78
	74.80	37.40	15.00	8.25	7.50	3.75	3.74
	45.20	22.60	9.04	6.78	4.52	2.26	2.26
	151.80	75.90	30.36	22.77	15.18	7.59	7.59
Insoluble Basic Phosphate of Lime } 16.50 } Phosphoric Acid,.....	178.20	89.10	35.64	26.73	17.62	8.91	8.91
	392.80	196.40	79.56	58.92	39.28	19.64	19.64
Bihydrated Sulphate of Lime } Gypsum, } 42.24 } Sulphuric Acid,.....	275.20	137.60	55.04	41.28	27.52	13.76	13.76
	176.80	88.40	35.36	26.52	17.68	8.84	8.84
	45.00	22.50	9.00	6.75	4.50	2.25	2.25
Carbon,.....	25.00	12.50	5.00	3.75	2.50	1.25	1.25
Silicates and Silicic Acid,.....	336.80	168.40	67.36	50.52	33.68	16.84	16.84
Water as Moisture,.....	85.60	42.80	17.12	12.84	8.56	4.28	4.28
Sulphate of Magnesia, Soda, Iron and Loss,.....							
The principal Fertilizing agents were							
Free Trihydrated Phosphoric Acid,.....	39.60	19.80	7.92	5.94	3.96	1.98	1.98
Soluble Phosphate of Lime,.....	295.20	147.60	59.04	44.28	29.52	14.76	14.76
Insoluble Basic Phosphate of Lime,.....	330.00	165.00	66.00	49.50	33.00	16.50	16.50
Bihydrated Sulphate of Lime,.....	844.80	422.40	168.96	126.72	84.48	42.24	42.24

Samples from the stock of Messrs. Patten & Miller, Commission Merchants, Savannah, Ga., selected by my brother Charles Colcock Jones, Jr., Esq., of Savannah, yielded the following results:

ANALYSIS 15. RHODES' SUPER-PHOSPHATE, FROM SAVANNAH. 1ST SAMPLE.

Free Trihydrated Phosphoric Acid } 2.68	Phosphoric Acid,.....	1.95	100 parts contain....	1.95	100 pounds contain pounds	3.90	200 pounds contain pounds	3.90	300 pounds contain pounds	7.80	400 pounds contain pounds	19.50	1,000 pounds contain pounds	7.30	1 Ton of 2,000 pounds contain pounds
Soluble Phosphate of Lime } 16.47	Water,.....	0.73	Metaphosphate of Lime } 13.92	Phosphoric Acid, Lime.....	9.73	19.46	8.44	5.04	5.85	2.92	38.92	97.30	42.20	7.30	39.00
Insoluble Phosphate of Lime } 16.75	Water,.....	2.52		Phosphoric Acid, Lime.....	4.22	8.44	5.04	7.79	2.19	16.88	25.20	42.20	25.20	14.60	194.60
Bihydrated Sulphate of Lime } (Gypsum) 44.36	Phosphoric Acid,.....	9.06	Sulphuric Acid,.....	Water,.....	7.79	15.38	18.12	9.06	23.07	30.76	36.24	76.90	76.90	90.60	153.90
Carbon,.....	Lime,.....	20.64		Water,.....	20.64	41.28	61.92	20.64	27.18	36.24	41.28	82.56	82.56	90.60	181.20
Silicic Acid and Silicates,.....	Water,.....	14.41	Carbon,.....	Water,.....	14.41	28.82	43.23	28.82	43.23	57.64	72.05	144.00	144.00	144.00	288.00
Sulphate of Magnesia and Soda,.....	Water,.....	9.29		Water,.....	9.29	18.58	27.87	9.29	18.58	27.87	37.16	74.32	74.32	80.00	160.00
Water as Moisture,.....	Water,.....	2.05	Sulphate of Iron and loss,.....	Water,.....	2.05	4.10	6.15	2.05	4.10	6.15	8.20	16.40	16.40	16.40	32.80
	Water,.....	0.80		Water,.....	0.80	0.60	0.60	0.80	0.60	0.60	0.60	0.60	0.60	0.60	0.60
	Water,.....	2.09	Sulphate of Iron and loss,.....	Water,.....	2.09	4.18	6.27	2.09	4.18	6.27	8.36	16.72	16.72	16.72	33.44
	Water,.....	14.80		Water,.....	14.80	29.60	44.40	14.80	29.60	44.40	59.20	118.40	118.40	118.40	236.80

The principal Fertilizing agents existed in the following quantities:

Free Trihydrated Phosphoric Acid,.....	2.68	5.36	8.04	10.72	26.80	53.60
Soluble Phosphate of Lime,.....	16.47	32.94	49.31	65.88	164.70	329.40
Insoluble Phosphate of Lime,.....	16.75	33.50	50.25	67.00	167.60	335.00
Bihydrated Sulphate of Lime, (Gypsum).....	44.36	88.72	133.08	177.44	443.60	887.20

ANALYSIS 16. RHODES' SUPERPHOSPHATE OF LIME FROM SAVANNAH—2D SAMPLE.

Free Trihydrated Phosphoric Acid, { 1.37	Phosphoric Acid, { Water, {	1.00	100 parts contain....	100 pounds contain pounds,.....	200 pounds contain pounds,.....	300 pounds contain pounds,.....	400 pounds contain pounds,.....	1000 pounds contain pounds,.....	1 Ton of 2,000 pounds contain pounds,...
Soluble Phosphate of Lime, { 15.56	Metaphosphate of { Lime, 13.30.. { Water, 2.36 ... {	9.50 3.70 2.36	9.50 3.70 2.36	9.50 3.70 2.36	19.00 7.40 4.72	28.50 11.10 7.08	38.00 14.80 9.44	95.00 37.00 23.60	190.00 74.00 47.20
Insoluble Phosphate of Lime, { (Bone Earth) 18.20	Phosphoric Acid, { Lime, {	8.37 9.83	8.37 9.83	16.74 19.66	25.11 29.49	33.48 39.32	43.70 51.10	83.70 98.30	167.40 196.60
Bihydrated Sulphate of Lime, { Gypsum, { 44.26	Sulphuric Acid, { Lime, { Water, {	20.59 14.41 9.26	20.59 14.41 9.26	41.18 28.82 18.52	61.77 43.23 27.78	82.36 57.64 37.04	105.90 141.10 93.60	205.90 288.20 185.20	411.80 588.20 370.40
Carbon, .....	.....	3.10	3.10	6.20	9.30	12.40	15.50	31.00	62.00
Silicic Acid and Silicates, .....	.....	1.40	1.40	2.80	4.20	5.60	7.00	14.00	28.00
Water as Moisture, .....	.....	13.61	13.61	27.22	40.83	54.44	68.05	136.10	272.20
Sulphates of Magnesia and Soda, Salts of Iron and loss, .....	.....	2.50	2.50	5.00	7.50	10.00	12.50	25.00	50.00

The most important fertilizing agents existed in the following proportions :

Free Trihydrated Phosphoric Acid,	1.37	2.74	4.11	5.48	13.70	27.40
Soluble Phosphate of Lime,	15.56	31.12	46.68	62.24	155.60	311.20
Insoluble Phosphate of Lime, (Bone Earth)	18.20	36.40	54.60	72.80	182.00	364.00
Bihydrated Sulphate of Lime, (Gypsum)	44.26	88.52	132.78	177.04	442.60	885.20

ANALYSIS 17. MEAN OF THE CHEMICAL EXAMINATIONS OF SAMPLES OF RHODES' SUPER-PHOSPHATE OF LIME, FROM SAVANNAH.

Free Trihydrated Phosphoric Acid } 2.02	Phosphoric Acid,.....	1.47	100 parts contain,....	100 pounds contain pounds,	200 pounds contain pounds,	300 pounds contain pounds,	100 pounds contain pounds,	1,000 pounds contain pounds,	1 Ton of 2,000 pounds contain pounds,....
Soluble Phosphate of Lime } 13.35	Water,.....	0.55		1.47	2.94	4.41	5.84	14.70	29.40
Metaphosphate of Lime } 16.01	Phosphoric Acid,.....	9.61		9.61	19.22	28.83	38.44	96.10	192.20
	Lime,.....	3.74		3.74	7.48	11.22	14.95	37.40	74.80
	Water,.....	2.66		2.66	5.32	7.98	10.64	26.60	53.20
Insoluble Basic Phosphate of Lime } (Bone Earth) 17.46	Phosphoric Acid,.....	8.03		8.03	16.06	24.09	32.12	80.30	160.60
	Lime,.....	9.41		9.41	18.88	28.32	37.76	94.40	188.80
Bihydrated Sulphate of Lime } Gypsum, 44.31	Sulphuric Acid,.....	20.61		20.61	41.22	61.83	82.44	206.10	412.20
	Lime,.....	14.42		14.42	28.84	43.26	57.68	144.20	288.40
	Water,.....	9.28		9.28	18.56	27.84	37.12	92.80	185.60
Carbon,.....		2.55		2.55	5.10	7.65	10.20	25.50	51.00
Silicic Acid and Silicates,.....		1.10		1.10	2.20	3.30	4.40	11.00	22.00
Sulphates of Magnesia, Soda, Salts of Iron and loss,.....		2.29		2.29	4.58	6.87	9.16	22.90	45.80
Water as Moisture,		14.21		14.21	28.42	42.63	56.84	142.10	284.20

The principal Fertilizing agents existed in the following proportions :

Free Trihydrated Phosphoric Acid,.....	2.02	2.02	4.04	6.06	8.08	20.20	40.40
Insoluble Phosphate of Lime,.....	16.01	16.01	32.02	48.03	64.03	160.10	320.20
Insoluble Basic Phosphate of Lime, (Bone Earth),.....	17.47	17.47	34.94	52.41	69.88	174.70	349.40
Bihydrated Sulphate of Lime, (Gypsum),.....	44.31	44.31	88.62	132.93	177.24	443.10	886.20

ANALYSIS 18. MEAN OF CHEMICAL EXAMINATIONS OF SAMPLES OF RHODES' SUPER-PHOSPHATE OF LIME,
FROM AUGUSTA AND SAVANNAH.

	100 parts contain,....	100 pounds contain pounds,	200 pounds contain pounds,	300 pounds contain pounds,	400 pounds contain pounds,	1,000 pounds contain pounds,	1 Ton of 2,000 pounds contain pounds,....
Free Trihydrated Phosphoric Acid {	Phosphoric Acid,.....	1.46	2.92	4.38	5.84	14.60	29.20
2.01	Water,.....	0.55	1.10	1.65	2.20	5.50	11.00
Soluble Phosphate of Lime {	Metaphosphate of Lime {	9.33	18.66	27.99	37.32	93.30	186.60
13.21	13.21	3.88	7.66	11.64	15.52	38.80	77.60
15.59	2.38	2.38	4.76	7.44	9.52	23.80	47.60
	Water,.....	2.38	4.76	7.44	9.52	23.80	47.60
Insoluble Phosphate of Lime, {	Phosphoric Acid,.....	7.88	15.76	23.64	31.52	78.80	157.60
Bone Earth, 17.15	17.15	9.27	18.54	27.81	37.08	92.70	185.40
Bihydrated Sulphate of Lime {	Sulphuric Acid,.....	20.29	40.58	60.87	81.16	202.90	405.80
(Gypsum), 42.95	42.95	14.20	28.40	42.60	56.80	142.00	284.00
	Water,.....	8.46	16.92	25.38	33.81	84.60	169.20
Carbon,.....	.....	2.80	5.60	8.40	11.20	28.00	56.00
Silicic Acid and Silicates,.....	.....	1.15	2.30	3.45	4.60	11.20	23.00
Sulphates of Magnesia, Soda, Iron Salts and Loss,.....	.....	2.95	5.90	8.85	11.80	29.50	59.00
Water as Moisture,.....	.....	15.08	30.16	45.24	60.32	150.80	301.60

The principal Fertilizing agents existed in the following proportions:

Free Trihydrated Phosphoric Acid,.....	2.01	2.01	4.02	6.03	8.04	20.10	40.20
Soluble Phosphate of Lime,.....	15.59	15.59	31.18	46.77	62.36	155.90	311.80
Insoluble Phosphate of Lime, (Bone Earth),.....	17.15	17.15	34.30	51.45	68.60	171.50	343.00
Bihydrated Sulphate of Lime, (Gypsum),.....	42.95	42.95	85.90	128.85	171.80	429.50	859.00

The individual constituents were determined in several samples of Rhodes' Superphosphate, from Augusta and Savannah, with the following results :

	ANALYSIS 19.				ANALYSIS 20.				ANALYSIS 21.				ANALYSIS 22.				ANALYSIS 23.				ANALYSIS 24.			
	1 Ton of 2000 pounds contain,.....	300 pounds contain ..	200 pounds contain ..	100 pounds contain ..	1 Ton of 2000 pounds contain ..	300 pounds contain ..	200 pounds contain ..	100 pounds contain ..	1 Ton of 2000 pounds contain,.....	300 pounds contain,...	200 pounds contain ..	100 pounds contain ..	1 Ton of 2000 pounds contain ..	300 pounds contain ..	200 pounds contain ..	100 pounds contain ..	1 Ton of 2000 pounds contain,.....	300 pounds contain ..	200 pounds contain ..	100 pounds contain ..	1 Ton of 2000 pounds contain ..	300 pounds contain ..	200 pounds contain ..	100 pounds contain ..
	17.79	35.58	53.37	85.50	22.28	44.56	66.84	105.60	20.33	40.66	60.99	106.60	21.84	43.68	65.52	106.80	21.84	43.68	65.52	106.80	19.37	38.74	58.11	98.74
	22.28	44.56	66.84	105.60	26.41	52.82	79.23	128.80	21.84	43.68	65.52	106.80	22.28	44.56	66.84	106.80	20.80	41.60	62.40	104.00	20.80	41.60	62.40	104.00
	26.41	52.82	79.23	128.80	26.48	52.96	79.44	129.60	26.48	52.96	79.44	129.60	26.48	52.96	79.44	129.60	27.09	54.18	81.27	128.00	27.09	54.18	81.27	128.00
	11.64	23.28	34.92	58.40	11.49	22.98	34.97	58.40	11.49	22.98	34.97	58.40	11.49	22.98	34.97	58.40	12.00	24.00	36.00	60.00	12.00	24.00	36.00	60.00
	16.84	33.68	50.52	83.60	13.61	27.22	40.83	67.20	13.61	27.22	40.83	67.20	13.61	27.22	40.83	67.20	14.80	29.60	44.40	74.00	14.80	29.60	44.40	74.00
Phosphoric Acid,.....																								
Sulphuric Acid,.....																								
Lime,.....																								
Water chemically combined,.....																								
Water as Moisture,.....																								

2. AMERICAN GUANO.—Samples of American Guano, from Jarvis & Baker's Islands, offered for sale in Augusta, yielded upon chemical analysis, the following results.

The Guano presented a reddish-brown color and consisted of a loose pulverized portion, and large lumps, varying in size and weight from a few grains to several pounds.

The lumps were hard, being with difficulty broken. In the state in which I examined this Guano, it was unfit for agricultural purposes. These hard lumps, although rich in Phosphate of Lime, would exert but little effect upon plants, on account of their insolubility. The lumps of American Guano should always be crushed before it is offered for sale.

ANALYSIS 25.—AMERICAN GUANO, (loose pulverized portion.)

	50 parts contain	100 pounds contain	500 pounds contain	800 pounds contain	100 pounds contain	1000 pounds contain	1 ton or 2000 pounds contain
Phosphate of Lime	50.150	50.150	100.300	150.450	200.600	401.50	1003.75
Carbonate of Lime	1.750	1.750	3.500	5.250	7.000	17.50	35.00
Sulphate of Lime	3.890	3.890	7.780	11.770	15.560	38.90	77.80
Ammonia	0.238	0.238	0.476	0.714	0.952	2.38	4.76
Organic Matters, rich in Carbon	7.212	7.212	14.424	21.636	28.848	72.12	144.24
Silicates Insoluble in Hydrochloric Acid	2.890	2.890	5.780	8.670	11.560	28.90	57.80
Sand	0.375	0.375	0.750	1.125	1.500	3.75	7.50
Water as Moisture	30.400	30.400	60.800	90.900	121.300	303.00	606.00
Chlorides & Sulph. of Potassa, Ammonia, Soda & loss	2.239	2.239	4.478	6.867	9.156	22.89	45.78

ANALYSIS 26—AMERICAN GUANO, (hard lump portion.)

	50 parts contain	100 pounds contain	500 pounds contain	800 pounds contain	100 pounds contain	1000 pounds contain	1 ton or 2000 pounds contain
Phosphate of Lime	59.00	59.00	118.00	177.00	236.00	472.00	944.00
Carbonate of Lime	2.90	2.90	5.80	8.70	11.60	23.20	46.40
Sulphate of Lime	2.71	2.71	5.42	8.13	10.84	21.68	43.36
Ammonia	0.15	0.15	0.30	0.45	0.60	1.20	2.40
Organic Matters, rich in Carbon	9.19	9.19	18.38	27.57	36.76	73.52	147.04
Silicates Insoluble in Hydrochloric Acid	0.79	0.79	1.58	2.37	3.16	6.32	12.64
Sand	—	—	—	—	—	—	—
Water as Moisture	22.60	22.60	45.20	67.80	90.40	180.80	361.60
Chlorides and Sulphate of Potassa, Iron, Alumina, Soda, Silicates, Soluble in Acid and loss	1.75	1.75	3.50	5.25	7.00	14.00	28.00

ANALYSIS 27.—AMERICAN GUANO—(Mixture of the Loose and Lump, representing the average composition of the Fertilizer.)

	100 parts contain.....	100 pounds contain pounds.....	300 pounds contain pounds.....	300 pounds contain pounds.....	1000 pounds contain pounds.....	1 Ton of 2000 pounds contain pounds....
Phosphate of Lime.....	54.575	54.575	109.150	163.725	218.900	545.75
Carbonate of Lime.....	2.325	2.325	4.650	6.675	9.300	23.25
Sulphate of Lime.....	3.303	3.303	6.606	9.909	13.212	33.03
Ammonia.....	0.357	0.357	0.714	1.071	1.428	3.57
Organic Matters rich in Carbon.....	8.201	8.201	16.402	24.603	32.804	82.01
Salts Insoluble in Hydrochloric Acid.....	1.840	1.840	3.680	5.520	7.360	18.40
Water.....	0.187	0.187	0.374	0.561	0.748	1.87
Water as Moisture.....	26.450	26.450	52.900	79.350	105.800	264.50
Chlorides and Sulphates of Potassa, Iron, Alumina, Soda, Silicates, Soluble in Acid and loss.....	2.014	2.014	4.028	6.032	8.156	20.14
						40.28

The following table will present the composition of various Commercial Manures, as determined by reliable Chemists.

TABLE 15.—COMPOSITION OF PHOSPHATIC GUANOS. *

	Phosphoric Acid,..... lbs.	Equivalent of Phosphoric Acid in Bone Phosphate of Lime, lbs.	Phosphate of Lime,..... lbs.	Lime,..... lbs.	Magnesia, lbs.	Chlorine,..... lbs.	Sulphuric Acid,..... lbs.	Organic Matter,..... lbs.	Phosphate of Alumina,..... lbs.	Sulphate of Lime,..... lbs.	Phosphate of Iron,..... lbs.	Sand,..... lbs.	Water,..... lbs.	Carbonic Acid and Ingredients not estimated,..... lbs.	Chrbonate of Lime,..... lbs.
BROWN MEXICAN GUANO.															
100 pounds contain,.....	16.32	35.36	.....	28.65	.....	.....	.....	9.35	.....	.....	.....	0.66	32.57	12.60	.....
200 do do,.....	32.64	70.72	.....	57.30	.....	.....	.....	18.70	.....	.....	.....	1.32	65.02	25.20	.....
300 do do,.....	48.96	106.08	.....	85.95	.....	.....	.....	28.05	.....	.....	.....	1.98	97.52	37.80	.....
400 do do,.....	65.28	141.74	.....	114.60	.....	.....	.....	37.40	.....	.....	.....	2.64	130.04	50.40	.....
500 do do,.....	81.60	176.50	.....	143.35	.....	.....	.....	46.65	.....	.....	.....	3.30	162.55	63.00	.....
One Ton of 2,000 pounds contain,.....	326.40	707.20	.....	57.30	.....	.....	.....	187.00	.....	.....	.....	13.20	650.20	126.00	.....
BROWN MEXICAN GUANO.															
100 pounds contain,.....	16.68	36.14	.....	28.21	.....	.....	.....	12.53	.....	.....	.....	0.21	29.28	13.09	.....
200 do do,.....	33.36	72.28	.....	56.42	.....	.....	.....	25.06	.....	.....	.....	0.42	58.56	26.18	.....
300 do do,.....	50.04	108.42	.....	84.63	.....	.....	.....	37.59	.....	.....	.....	0.63	87.84	39.27	.....
400 do do,.....	66.72	144.56	.....	112.84	.....	.....	.....	49.62	.....	.....	.....	0.84	117.62	52.36	.....
500 do do,.....	83.40	180.70	.....	141.05	.....	.....	.....	62.66	.....	.....	.....	1.05	146.40	65.45	.....
One Ton of 2,000 pounds contain,.....	333.40	722.50	.....	564.20	.....	.....	.....	260.06	.....	.....	.....	3.20	585.60	261.80	.....
BROWN MEXICAN GUANO.															
100 pounds contain,.....	24.24	52.74	.....	26.80	.....	.....	.....	20.93	.....	.....	.....	0.12	54.94	2.84	.....
200 do do,.....	48.48	105.48	.....	53.76	.....	.....	.....	41.86	.....	.....	.....	0.24	109.88	5.68	.....
300 do do,.....	73.02	158.22	.....	80.77	.....	.....	.....	62.79	.....	.....	.....	0.36	164.82	8.52	.....
400 do do,.....	97.36	210.86	.....	107.77	.....	.....	.....	83.72	.....	.....	.....	0.48	219.36	11.36	.....
500 do do,.....	121.70	263.70	.....	134.45	.....	.....	.....	104.65	.....	.....	.....	0.60	284.20	14.20	.....
One Ton of 2,000 pounds contain,.....	486.80	1054.80	.....	537.80	.....	.....	.....	418.60	.....	.....	.....	2.40	496.80	46.80	.....
BROWN MEXICAN GUANO.															
100 pounds contain,.....	16.16	35.01	.....	28.80	.....	8.45	.....	35.49	.....	.....	.....	1.99	13.11	6.19	.....
200 do do,.....	32.32	70.02	.....	41.72	.....	9.70	.....	70.98	.....	.....	.....	2.18	26.22	12.38	.....
300 do do,.....	48.48	105.03	.....	62.58	.....	14.55	.....	109.47	.....	.....	.....	2.37	39.33	18.57	.....
400 do do,.....	64.64	140.04	.....	83.44	.....	19.40	.....	141.76	.....	.....	.....	4.36	62.44	24.76	.....
500 do do,.....	80.80	175.05	.....	104.30	.....	24.25	.....	177.44	.....	.....	.....	5.45	65.55	30.96	.....
One Ton of 2,000 pounds contain,.....	323.5	709.20	.....	317.30	.....	97.00	.....	709.80	.....	.....	.....	10.90	262.20	123.8	.....

* I have calculated and drawn up this table from the Analyses of Dr. Snowden Piggot, of Baltimore. See first report of Philip T. Tyson, State Agricultural Chemist to the House of Delegates of Maryland. 1860, p.91, 100.

TABLE 10.—COMPOSITION OF PHOSPHATIC GUANOS—CONTINUED.

[illegible]

TABLE 15—CONTINUED.

	Carbonate of Lime,..... lbs.	Carbonic Acid and Ingredients not Estimated,..... lbs.	Water,..... lbs.	Sand,..... lbs.	Phosphate of Iron,..... lbs.	Sulphate of Lime,..... lbs.	Phosphate of Alumina,..... lbs.	Organic Matter,..... lbs.	Sulphuric Acid,..... lbs.	Chlorine,..... lbs.	Magnesia,..... lbs.	Lime,..... lbs.	Phosphate of Lime,..... lbs.	Equivalent of Phosphoric Acid in Bone Phosphate of Lime,..... lbs.	Phosphoric Acid,..... lbs.
BROWN AFRICAN GUANO, CAPE COLONY.															
100 pounds contain,.....	17.46	.....	0.61	.....	9.88	.....	10.44	.....	.....	.....	.....	40.24	.....	.....
200 do do,.....	34.92	.....	1.22	.....	19.76	.....	20.88	.....	.....	.....	.....	81.48	.....	.....
300 do do,.....	52.38	.....	1.83	.....	38.64	.....	31.32	.....	.....	.....	.....	120.72	.....	.....
400 do do,.....	69.84	.....	2.44	.....	39.52	.....	41.76	.....	.....	.....	.....	160.96	.....	.....
500 do do,.....	87.30	.....	3.05	.....	46.40	.....	52.20	.....	.....	.....	.....	201.20	.....	.....
One Ton of 2,000 pounds contain,.....	349.20	.....	12.20	.....	197.60	.....	208.80	.....	.....	.....	.....	804.80	.....	.....
JARVIS ISLAND GUANO.															
100 pounds contain,.....	1.22	.....	76.72	.....	.....	.....	.....	Phosphate of Magnesia 1.65	.....	16.53	.....	.....
200 do do,.....	2.44	.....	153.44	.....	.....	.....	.....	3.30	.....	33.06	.....	.....
300 do do,.....	3.66	.....	230.16	.....	.....	.....	.....	4.95	.....	49.52	.....	.....
400 do do,.....	4.88	.....	306.88	.....	.....	.....	.....	6.60	.....	66.12	.....	.....
500 do do,.....	6.10	.....	383.60	.....	.....	.....	.....	8.25	.....	82.65	.....	.....
One Ton of 2,000 pounds contain,.....	24.40	.....	1534.40	.....	.....	.....	.....	33.00	.....	330.60	.....	.....
WHITE MEXICAN GUANO.															
100 pounds contain,.....	0.11	.....	.....	.....	7.10	.....	.....	.....	43.91	.....	.....	.....
200 do do,.....	0.22	.....	.....	.....	14.20	.....	.....	.....	87.82	.....	.....	.....
300 do do,.....	0.33	.....	.....	.....	21.30	.....	.....	.....	131.73	.....	.....	.....
400 do do,.....	0.44	.....	.....	.....	28.40	.....	.....	.....	175.64	.....	.....	.....
500 do do,.....	0.55	.....	.....	.....	35.50	.....	.....	.....	219.55	.....	.....	.....
One Ton of 2,000 pounds contain,.....	1.10	.....	.....	.....	142.00	.....	.....	.....	378.20	.....	.....	.....
COLUMBIAN GUANO.															
100 do do,.....	0.63	.....	4.21	.....	8.95	.....	.....	.....	38.75	.....	.....	.....
200 do do,.....	1.26	.....	8.42	.....	17.90	.....	.....	.....	77.60	.....	.....	.....
300 do do,.....	1.89	.....	12.63	.....	26.85	.....	.....	.....	116.25	.....	.....	.....
400 do do,.....	2.52	.....	16.84	.....	35.80	.....	.....	.....	155.00	.....	.....	.....
500 do do,.....	3.15	.....	20.05	.....	44.75	.....	.....	.....	193.75	.....	.....	.....
One Ton of 2,000 pounds contain,.....	12.60	.....	84.20	.....	179.00	.....	.....	.....	775.00	.....	.....	.....

	Carbonate of Lime,...	Carbonic Acid and In- gredients not Esti- mated,.....	Water,.....	Sand,.....	Phosphate of Iron,...	Sulphate of Lime,...	Phosphate of Alumina	Organic Matter,.....	Sulphuric Acid,.....	Chlorine,.....	Magnesia	Lime,.....	Phosphate of Lime,...	Equivalent of Phos- phoric Acid in Bone Phosphate of Lime	Phosphoric Acid,.....
	lbs.	lbs.	lbs.	lbs.	Oxide of Iron,	lbs.	Alumina,	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
SOMBRERO GUANO.															
100 pounds contain,.....	0.69	.....	.....	.....	.....	.....	4.97	7.07	.....	0.35	1.56	44.66	.....	75.04	34.65
200 do do,.....	1.38	.....	.....	.....	.....	.....	9.94	14.14	.....	0.70	3.12	89.32	.....	150.08	69.30
300 do do,.....	2.07	.....	.....	.....	.....	.....	14.91	21.21	.....	1.05	4.65	133.95	.....	225.12	103.65
400 do do,.....	2.76	.....	.....	.....	.....	.....	19.88	28.28	.....	1.40	6.20	178.64	.....	300.16	138.60
500 do do,.....	3.45	.....	.....	.....	.....	.....	24.85	35.35	.....	1.75	8.90	223.30	.....	375.20	173.25
One Ton of 2,000 pounds contain,.....	13.80	.....	.....	.....	.....	.....	99.40	141.40	.....	7.00	31.20	893.20	.....	1500.80	693.00
SOMBRERO GUANO.															
100 pounds contain,.....	2.76	.....	.....	.....	.....	.....	4.13	7.07	.....	0.35	0.55	41.62	.....	79.73	36.80
200 do do,.....	5.52	.....	.....	.....	.....	.....	8.26	14.14	.....	0.70	0.70	83.04	.....	159.46	73.60
300 do do,.....	8.28	.....	.....	.....	.....	.....	12.39	21.21	.....	0.95	0.85	124.56	.....	239.19	110.40
400 do do,.....	11.04	.....	.....	.....	.....	.....	16.52	28.28	.....	1.40	1.04	169.08	.....	308.92	147.20
500 do do,.....	13.80	.....	.....	.....	.....	.....	20.65	35.35	.....	1.75	1.75	207.60	.....	393.65	184.00
One Ton of 2,000 pounds contain,.....	49.70	.....	.....	.....	.....	.....	82.60	141.40	.....	7.00	7.00	530.40	.....	1594.60	736.00
SOMBRERO GUANO.															
100 pounds contain,.....	0.51	.....	.....	.....	.....	.....	.....	12.27	.....	.....	1.07	49.27	.....	77.75	35.62
200 do do,.....	1.02	.....	.....	.....	.....	.....	.....	24.54	.....	.....	2.14	80.51	.....	155.50	71.24
300 do do,.....	1.53	.....	.....	.....	.....	.....	.....	36.81	.....	.....	3.21	120.81	.....	232.25	106.86
400 do do,.....	2.04	.....	.....	.....	.....	.....	.....	49.08	.....	.....	4.28	161.03	.....	300.69	142.48
500 do do,.....	2.55	.....	.....	.....	.....	.....	.....	61.35	.....	.....	5.35	201.35	.....	388.75	178.10
One Ton of 2,000 pounds contain,.....	10.20	.....	.....	.....	.....	.....	.....	245.40	.....	.....	21.40	805.40	.....	1555.00	712.40
NEVASSA GUANO.															
100 pounds contain,.....	4.11	.....	.....	.....	.....	.....	.....	12.72	.....	.....	.....	29.66	.....	63.40	31.65
200 do do,.....	8.22	.....	.....	.....	.....	.....	.....	25.44	.....	.....	.....	59.32	.....	126.80	63.32
300 do do,.....	12.33	.....	.....	.....	.....	.....	.....	38.16	.....	.....	.....	88.93	.....	190.37	89.93
400 do do,.....	16.44	.....	.....	.....	.....	.....	.....	50.88	.....	.....	.....	118.64	.....	273.96	120.64
500 do do,.....	20.55	.....	.....	.....	.....	.....	.....	63.60	.....	.....	.....	148.30	.....	312.45	153.30
One Ton of 2,000 pounds contain,.....	82.20	.....	.....	.....	.....	.....	.....	254.40	.....	.....	.....	593.20	.....	1269.8	633.20
EL MONTANA GUANO.															
100 pounds contain,.....	0.80	.....	.....	.....	.....	.....	.....	5.11	.....	.....	8.65	46.18	.....	60.47	27.78
200 do do,.....	1.60	.....	.....	.....	.....	.....	.....	10.22	.....	.....	17.30	92.36	.....	120.94	55.56
300 do do,.....	2.40	.....	.....	.....	.....	.....	.....	15.33	.....	.....	25.95	138.54	.....	181.51	83.34
400 do do,.....	3.20	.....	.....	.....	.....	.....	.....	20.44	.....	.....	34.60	184.72	.....	242.00	111.12
500 do do,.....	4.00	.....	.....	.....	.....	.....	.....	25.55	.....	.....	43.75	229.96	.....	302.56	138.80
One Ton of 2,000 pounds contain,.....	17.20	.....	.....	.....	.....	.....	.....	102.20	.....	.....	173.00	919.20	.....	1203.40	555.50

TABLE 16—CONTINUED.

[illegible]

(2) By Th. Way, of England. Journal of the Royal Agricultural Society of England, vol. x, Part 1 Liebig & Köpp's Report, vol. 3, p. 461.

TABLE 17. AMMONIA GUANO.

	Water and Organic Mat- ter.....	lbs.	Water.....	lbs.	Sand and Silica.....	lbs.	Chloride of Sodium.....	lbs.	Soda.....	Potassa.....	Sesquioxide of Iron.....	Magnesia.....	Lime.....	Sulphuric Acid.....	Phosphate of Lime Equiv- alent to the total Phos- phoric Acid.....	Phosphoric Acid.....	Ammonia Potential.....	Ammonia.....	Organic Substance and Ammonia Salts.....
100 pounds contain.....		47.07		1.31	18.38		1.21	2.13	3.07	0.27	0.70	3.88	9.70	3.88	12.41	20.91			47.07
200 do do.....		94.08		2.62	36.6		2.42	4.26	6.14	0.54	1.40	7.66	19.98	7.66	24.82	40.13			94.08
300 do do.....		141.12		3.93	54.9		3.63	6.39	9.21	0.81	2.10	11.49	29.10	11.49	37.23	60.13			141.12
400 do do.....		188.16		5.24	73.2		4.84	8.52	12.28	1.08	2.80	15.32	38.80	15.32	49.61	80.24			188.16
500 do do.....		235.20		6.55	91.6		6.05	10.62	15.35	1.35	3.50	19.15	48.80	19.15	62.66	101.65			235.20
One Ton of 2,000 pounds contain.....		940.80		26.20	366.0		24.20	42.60	61.40	4.40	11.00	76.60	194.60	76.60	248.70	404.20			940.80
(1) PERUVIAN GUANO.																			
100 pounds contain.....		83.67		1.72	12.57		2.57	4.15	6.00	0.22	0.80	4.00	16.49	4.00	20.91	30.21			83.67
200 do do.....		167.34		3.44	25.14		5.14	8.30	12.00	0.44	1.60	8.00	32.98	8.00	40.13	60.43			167.34
300 do do.....		251.01		5.16	37.71		7.71	12.45	18.00	0.66	2.40	12.00	49.47	12.00	60.13	90.65			251.01
400 do do.....		334.68		6.88	50.28		10.28	16.60	24.00	0.88	3.20	16.00	65.96	16.00	82.45	120.90			334.68
500 do do.....		418.35		8.60	62.85		12.85	20.75	30.00	1.10	4.00	20.00	82.45	20.00	101.65	150.90			418.35
One Ton of 2,000 pounds contain.....		1673.40		24.40	251.40		31.40	50.00	72.00	4.40	16.00	80.00	329.80	80.00	404.20	604.20			1673.40
(1) PERUVIAN GUANO.																			
100 pounds contain.....		46.61		1.21	12.50		2.66	0.91	3.22	0.23	0.62	4.54	11.47	4.54	14.47	21.47			46.61
200 do do.....		93.22		2.42	25.00		5.32	1.82	6.44	0.46	1.24	9.08	22.94	9.08	28.94	42.94			93.22
300 do do.....		139.83		3.63	37.50		7.93	2.73	9.66	0.69	1.86	13.62	34.41	13.62	42.41	63.41			139.83
400 do do.....		186.44		4.84	50.00		10.69	3.64	12.88	0.92	2.88	18.16	45.88	18.16	57.88	85.88			186.44
500 do do.....		233.05		6.05	62.50		13.30	4.65	16.10	1.15	3.10	22.70	57.35	22.70	77.35	115.35			233.05
One Ton of 2,000 pounds contain.....		932.20		24.40	251.00		31.30	13.30	53.20	4.40	12.40	90.80	229.40	90.80	367.40	547.40			932.20
(1) PERUVIAN GUANO.																			
100 pounds contain.....		52.97		1.42	13.67		2.09	1.42	2.09	0.31	0.73	2.52	10.38	2.52	14.56	21.56			52.97
200 do do.....		105.94		2.84	27.34		4.04	2.84	4.04	0.62	1.46	5.04	20.76	5.04	30.76	45.76			105.94
300 do do.....		158.91		4.26	40.01		6.06	4.26	6.06	0.93	2.19	7.56	31.14	7.56	43.14	64.14			158.91
400 do do.....		211.88		5.68	52.68		8.08	5.68	8.08	1.24	2.92	10.08	41.52	10.08	53.52	79.52			211.88
500 do do.....		264.85		7.10	65.35		10.10	7.10	10.10	1.55	3.65	12.60	51.90	12.60	64.90	96.90			264.85
One Ton of 2,000 pounds contain.....		1059.40		28.40	273.40		20.20	28.40	28.40	7.30	18.40	50.40	207.60	50.40	207.60	291.20			1059.40
(2) PERUVIAN GUANO.																			
100 pounds contain.....		8.93		1.69	13.67		1.69	1.69	1.69										8.93
200 do do.....		17.86		3.38	27.34		3.38	3.38	3.38										17.86
300 do do.....		26.79		5.07	40.01		5.07	5.07	5.07										26.79
400 do do.....		35.72		6.76	52.68		6.76	6.76	6.76										35.72
500 do do.....		44.65		8.45	65.35		8.45	8.45	8.45										44.65
One Ton of 2,000 pounds contain.....		179.00		33.50	273.40		33.50	33.50	33.50										179.00

(1) Th. Way. Jour. of the Royal Agr'l. Society of Eng. X, Part I, Liebig & Kopp's Annual Rep. v. 3, p. 461. (2) Prof. S. W. Johnson, "Fertil. Muck and Com. Manures."

A careful comparison of the Chemical constitution of these commercial manures, demonstrates that each constituent varies in amount, within wide limits, thus, in Phosphatic Guanos, the most valuable ingredient, the Phosphate of Lime, varies from 330 pounds to 1759 pounds in the Ton of 2000 pounds; in some varieties of the Phosphatic Guanos, presenting very nearly the same general appearance with the best varieties, Phosphoric Acid is combined with Iron and Alumina, and not with lime: in the Ammonia—Phosphatic guanos, the Ammonia and Organic matters capable of generating Ammonia and the Phosphate of Lime, vary within wide limits, not only in guanos from different localities, but even in Guanos said to be from the same locality; and in the Peruvian Guano, not only do the individual constituents, the Phosphates, the Alkaline Salts, the organic matters and the Ammonia, vary within wide limits, but what is of considerable importance in the action of the guano upon the soil and plants, the state of combination of the various constituents, especially of the organic matters, vary within wide limits.

The following questions, highly important to the planter demand an answer.

Do the venders of these fertilizers inform the Planters of these variations?

Do the venders of fertilizers fix their prices in accordance with these variations, and with the actual value of the fertilizing principles?

The actual value of these fertilizers may be ascertained by determining the agricultural value of the individual constituents.

The actual or agricultural value to the planter is determined by the increased yield which these manures are capable of producing.

The experiments upon the increased yield which these fertilizers are capable of producing in Georgia, are not yet completed, for the present purpose therefore we will avail ourselves of the labors of English and American Chemists

in countries where definite experiments have determined the actual value of the individual constituents. According to Professor Johnson, the principle constituents of fertilizers possess the following values.

Soluble Phosphoric Acid	.	.	14	cents	per	pound.
Insoluble	"	"	"	4 $\frac{1}{2}$	"	"
Insol. Phosphate of Lime (Bone Earth)	2.	"	"	"	"	"
Ammonia	.	.	14.	"	"	"

If now we apply these numbers, which I am convinced are too high rather than too low for the great body of our Georgia lands, we will find that the actual values of commercial fertilizers differ in many cases widely from the values at which they are offered in the Georgia market; we will find that the commercial value is often above and never below the actual value; and we will find that inferior articles frequently command as high prices as the very best. An examination of the manufactured compounds, leads to similar conclusions.

With reference to manipulated compounds it would seem that every planter who reflected for one moment, would see that if the planter is compelled to purchase commercial fertilizers he had better make his own manipulations and compounds for these sufficient reasons.

There must be some profit upon each compound introduced into the mixture. If there be not some profit over and above the actual cost of the guanos and other ingredients entering into the manipulated manure, how do the manufacturers of these compounds manage to make such profits? If there be no profits made upon each ingredient, why are our papers loaded with brazer advertisements, each claiming to be "the best compound in the world?" If the original guanos and other materials used in these manipulated compounds are sold at too high a price by the importers, and if a handsome profit is made on each ingredient, is it not evident that the planter would do better to make his own compounds? and is it not evident that the planter would do better still to use the resources for the

regeneration of his land, which Providence has placed upon his own soil, and abandon these imported articles which are liable to great variations, until at least some arrangement is made by the State to compel the venders of these compounds to submit them to the constant examination of competent chemists?

Well established facts, prove that not only manipulated manures, but also Guanos are in some instances greatly adulterated. To substantiate these propositions we have selected the following facts which rest upon the testimony of responsible and competent men. Professor Philip T. Tyson, State Agricultural Chemist of Maryland, in his recent able report to the House of Delegates of Maryland, thus notices the adulterations of Guanos and manufactured fertilizers.

“It appears that the adulteration of Guanos, especially the Peruvian is very extensively practiced in Great Britain, and I regret to be obliged to believe that frauds of this kind, are also perpetrated in our own country.

In order to protect our farmers against such impositions, the system of inspection of guano was instituted in our State, and it has doubtless been a means of protection to a considerable extent.

But yet, it appears from the testimony of many farmers that they have had palmed upon them sometimes inferior or adulterated Guano, with the inspectors mark upon the bags. Gentlemen have informed me, that boatmen who have brought them Peruvian Guano, have offered to furnish them with good new bags, for the Guano bags containing the inspectors mark! Suspecting however that they were wanted for dishonest uses, they refused to part with them.

There is a peculiar earth on the southern slope of Hamstead Hill near the eastern limit of Baltimore, of which I have been informed large quantities have been, and may still continue to be secretly carted into the city. There being no conceivable honest use, for which this material

can be brought into the city, and it being very similar in color to Peruvian Guano, it was reported to be used to adulterate that article, the mixture being put up and sold in old guano bags containing the inspectors mark! Some months since the inspector called the attention of the police to the affair, who arrested parties carting away this earth in Guano bags during the night. The arrest was evidently made at an injudicious time, because upon examination the bags were found to contain only earth. If however, the parties had been watched until they had taken it to their mixing depot, and completed the crime, they might possibly have been properly punished.

During the late season of active field work, I endeavored to collect for examination samples of Guano, ground bones and artificial fertilizers, which had been purchased and received by my farming friends. Finding but few kinds in their possession, I requested that samples might be forwarded me whenever they shall again purchase. Among others I got in person a sample of guano from Col. John S. Sellman, of Anne Arundel county, which being sold for Mexican A. A. should have contained Phosphoric Acid equal to 55 per cent. or more, of Phosphate of Lime, and yet the analysis showed but 36 per cent. In this case the Colonel paid for 50 per cent. or more, Phosphate of Lime than was implied in the purchase, and if the deficiency had not been discovered, he would have suffered a still greater loss, by not applying a proper dose of the phosphate to his soil. How much of this Guano was sold and used by farmers, I have no means of knowing."* * * * Professor Johnson determined the value of several fertilizers.

1st. MAPIS SUPER-PHOSPHATE from Newark, N. J. In 1852 its calculated value was \$44. In 1857 it had degenerated to \$15, owing to the introduction of worthless matter and the total absence of soluble Phosphoric Acid.

2d. Another article called MAPES NITROGENIZED possessed a value by calculation in 1856, of \$21; and in 1857 one sample proved to be worth \$14.50, and a second \$12.50, so that it seems to be going down pretty fast.

3d. The name of DE BURG's Super Phosphate of Williamsburg, Long Island, so familiar to farmers from advertisements proved to be worth, in 1852, \$32; in 1856, \$36.25, and in 1857 it had fallen to \$21.50.

4th. COE'S SUPERPHOSPHATE, from Middletown, Conn., has proven more uniform in composition as shown by seven analysis between 1854 and 1857, its value being as follows: \$33.75; \$33. \$41. \$33. \$35. and \$33.25.

5th. Professor Johnson calculated the value of RHODES SUPER-PHOSPHATE of Lime, (a Baltimore article,) from three analyses to be 32.25, and his results, he remarks, do not seriously differ from those of Dr. Higgins and Bickell.

JOURDANS SUPER-PHOSPHATE.—Since this capter was placed in the hands of the printer, Dr. Piggot has reported to me the results of analysis of two samples of an article under the above name. They were furnished by Maj. Edward Wilkens, of Kent. county.

The first was purchased in 1858, and was used with good effect by many farmers in that county. The second was purchased in 1859. Their composition is as follows:

	1858.	1859.
Gypsum or Plaster of Paris . . .	25.30	39.31
Soluble Phosphate of Lime . . .	2.53	2.95
Free Phosphoric Acid . . .	6.86	4.45
Lime otherwise combined . . .	2.07	
Phosphoric Acid com'd with lime and magnesia		2.23
Sand . . .	11.04	14.30
Animal Charcoal and organic matter, } (Containing some ammonia,) . }	22.30	12.32
Magnesia, Iron, water &c., not determined	4.66	15.95

The useful matters may be summed up as follows, and I have also calculated their money value in the manner adopted by Professor Johnson.

THAT OF 1858.

	Per ct.	Price.	Am't.
Gypsum . . .	25.30	$\frac{1}{3}$ ct.	\$0.08 $\frac{1}{2}$
Phosphoric Acid Insoluble . .	11.65	4 $\frac{1}{2}$ ct.	0.52 $\frac{1}{2}$
“ “ Soluble . .	8.40	12 $\frac{1}{2}$ ct	1.05
Value of 100 lbs. of the fertilizer .			\$1.66

ARTICLE XXV.

Case of Inflammation of Os and Cervix Uteri Cured by the Cautery. By P. WADE DOUGLAS, M. D., Dublin, Ga.

So conflicting are the opinions of our standard medical writers upon the diagnosis, and especially the treatment of certain diseases, that deep thought and investigation are demanded at the hands of every honest physician, or else rational medicine would give place to routinism, and numbers of suffering humanity would be hurried hence, the victims of the *generous* dispenser of *prescribed remedies*.—"The time has passed away when the human mind is to credit the *mene verba magistri*, or to place implicit evidence in a scientific assertion, without examination, because it proceeds from this or that individual." But I propose, in this brief article, reporting a case of inflammation of the Os and Cervix Uteri, with my treatment, as recommended by Prof. Jos. A. Eve, in his report read before the Medical Society of the State of Georgia, and in opposition to the views of the distinguished and learned Dr. Charles West. I will not quote from either writer, as it would consume space and time, but leave it to those who feel interested to read for themselves.

About the middle of February of the present year, I was called in to see Molsey, a mulatto negro woman, aged 33 or 34, and weighing 170 pounds. I found her with symptoms of suppressed menstruation, but learning that she had been sick for two weeks and had passed her catamenial period, I simply relieved the urgency of the symptoms, and put her upon a plan of treatment best calculated, in my opinion, to re-establish the flow. Somewhat to my surprise, however, though no debilitating medicines had been given her, save those at her first attack, I found a transition rapidly taking place from a condition of plethora to that of anemia; notwithstanding this, as the time approached for a menstrual discharge, I resorted alternately to blisters, electricity, hot hip baths, stimulating vaginal injections, and the tincture of cantharides, etc., and it was not until then

that I became apprehensive that the cause was *local* and *not* constitutional, especially when I learned from her intelligent master, Judge Roe, that her last labor was very tedious, and that she had not menstruated since the birth of her last child, ten months ago. Believing too, that the woman "was not sick because she did not menstruate, but that she did not menstruate because she was sick," and looking, but alas, to no purpose, for a cause in the constitution, regarding anything that the speculum might reveal as trivial in importance, my mind being prejudiced against every local curative means other than was already used, the cautery especially, as taught in the excellent work of Dr. West, I became hopeless, consulted several physicians, but without any additional light, my patient in the meantime in a perfect state of imbecility, bordering on to insanity. "Altogether passing away was impressed visibly upon every feature of this case," and finally the pitying interrogations came up, "Why can't she die," as everything that had been done seemed unavailing to produce the least perceptible good.

Happily, about this time, the report of Dr. Eve fell into my hands, and at once I was convinced of the importance of using something more than constitutional remedies and injections, and resorted to cauterization of the mouth and canal of the womb with the solid nitrate of silver. And, sir, I attribute to it, "*vim carminis*," almost daily, yea, hourly, could I perceive a gradual restoration to health of both body and mind, three weekly applications being sufficient to effect a permanent cure.*

If there had been any apparent signs of recovery at the time of first applying the cautery, or if I had continued the use of any constitutional medicines during the three weeks of its application, there might have been left room for doubt in my mind of according all the cure to the caustic. But nothing else was done for her and she is now at work.

Diphtheritis. By. C. A. HARTMANN, M. D., Cleveland, Ohio.

The disease now generally designated by this name has been brought forward as a new affection, and largely discussed during the last two years, especially in France, England, and America. It appears to have been frequently confounded with croup, gangrenous and scarlatinous angina, and other affections of the throat; even Bretonneau, who principally initiated, in 1821, the recent consideration of the disease, did not distinguish it clearly, giving it the names *diphtherite*, *croup*, *angine maligne gangreneuse*, promiscuously. According to him, it is the same with the *Egyptian disease* of the Greeks. Dr. Baird had previously in this country recorded the particulars of an epidemic that occurred in New York, in 1771. He described it under the name of *suffocative angina*. Other older names applied to it are *cynanche maligna*, *scarlatina anginosa* (in America often used up to the present day), *morbus strangulatorius* (Dr. Starr, 1745), *Fothergill sore throat*, *throat distemper*, *malignant sore throat*, *malignant angina*, *membranous angina*, etc.

Hippocrates seems to have been acquainted with it, and a very good description is given by Aretæus. Since then there is no record pointing to diphtheritis until the days of Cullen, Huxham, Fothergill, Starr, and others, in the second half of the last century; and although they described it as a "new and separate disorder," it fell again into neglect, until more recently the notices of Baird and Bretonneau were followed by a very extensive epidemic appearance of the disease, it spreading, between the years 1818-'57, over France, since 1857 over England, and since 1845 over this continent.

Besides the general name, *diphtheritis*, *diphtherite*, *diphtheria* (meaning an exudation in patches), a large number of designations are found in the works of recent writers. It is the *angina diphtheritica maligna* of Trousseau, *angina couenneuse* of Duche, Bouchut, and other French authors; commonly called *diphtheric*, in French; the *plastic pharyngitis* of Pory; the *membranous disease*, commonly called *membranous croup*, of Cotting; the *hog-skin angina* of Palmer; *diphtheric*, *membranous*, *pseudo-membranous*, *putrid*, *malignant*, and *epidemic sore-throat*, *scarlatina*, or *epidemic angina*, *malignant cynanche*, of other American physicians. Some call it simply *sore throat*.

Diphtheritis proper is an eminently fatal, mostly epidemic, but not unfrequently sporadic disease, of a very peculiar

character, appearing with a great variety of symptoms, but presenting, as general features, a marked prostration of the nervous system, and the formation of a pseudo-membranous exudation, which always commences with patches upon a congested surface, and manifests a particular propensity to attack the mucous membrane of the fauces, spreading downwards and upwards; it is, however, occasionally seen upon other mucous membranes, and even upon the skin. Children suffer particularly, but young persons and adults are not exempted from attacks of the disease.

The symptoms, not only at different times and in different locations, but during the same epidemic and in the same place, are so variable that it is difficult to give a description of them of any general applicability. "In not two cases," says one author, "there is a perfect resemblance, either in the grouping of the symptoms, in their order of succession, or in the degree of their individual symptoms." Some cases commence with fever; in others there is none, or it only appears after some time; there may be a diminished secretion of urine, or not; aluminuria is often present, but frequently wanting; so it is with headache, difficult respiration, diarrhoea. Some of the more constant symptoms are generally malaise, impaired deglutition, and a weak, accelerated pulse. One fact seems to be pretty well established: the statements of Trousseau and others show that the disease since 1846 assumed a more violent and malignant character, entirely different from what it was in the time of Bretonneau.

The last named physician gave the following description: The disease usually commences in one tonsil, seldom in both; slight fever; white spots on the affected tonsil; enlarging of the cervical glands. Redness surrounds the concretion, and it spreads rapidly to the velum palati, uvula, the other tonsil, and the pharynx. The swelling of the lymphatics either subsides or remains stationary. After some hours or days a ringing cough, dry, or accompanied by a frothy expectoration, announces the extension of the disease to the respiratory organs. There are now irregularly-shaped patches of redness, without swelling, coated with a concrete exudation. One or more long, narrow, red streaks extend to the pharynx or trachea; a stripe of concrete matter is seen on the centre of each of these streaks, and small, semi-transparent vesicles often appear in the substance of these incipient concretions. The edges of the

pellicle are gradually lost in the surrounding mucus, which is no longer viscid, but coagulated near the concretion. The latter can be easily detached; it is, however, in such case speedily reproduced, being now firmly adherent, often several lines thick, and changing its color from a yellowish-white to yellow, gray, and finally to black. The subjacent surface is usually of a slightly red tint, more vivid at the periphery of the patches, and sown all over with points of a deeper red color, through which points the blood readily transudes. Now the alteration of the organic surfaces becomes more manifest; often concrete matter is deposited into the very substance of the mucous membrane; there is a slight erosion, and sometimes ecchymoses, in points exposed to friction, or from which the avulsions of the concretions has been attempted. The corrupted exudations exhale an infectious odor. If circumscribed, they appear depressed, from the œdematous swelling of the surrounding cellular tissue; if they are, on the contrary, extended over considerable surface, they become partially detached, and hang down in shreds more or less putrefied, simulating the last stage of sphacelus.

Dr. David Wooster, of San Francisco, remarks on this (*Pacific Med. and Surg. Journ.*, May, 1859), that "no vesicles have ever been observed in the forming concretion on this continent; that here at the incipient state the false membrane adheres most tenaciously, and is not easily detached; that the edges of it shade off so insensibly into the natural aspect of the neighborhood as to render a rigorous definition of its limits impossible; that the centre of the patch is whitish or grayish, and opaque, while its periphery becomes more and more translucent; further, that the affected parts never bleed, except when violence is used to tear or scrape off the false membrane, and then the bleeding stops with remarkable promptitude, and does not occur again, except on the repetition of the violence." Wooster states, also, that "our false membrane never becomes black; indeed, it is paler after than before death."

According to Dr. W. G. Dyas (*Chic. Med. Journ.*, Oct., 1859, to March, 1860), there are at least four distinct forms under which the disase may appear:

1. "It may destroy life in a few hours, by a violent and deep impression on the nervous centres, attended by congestion of the internal organs; in this form we may not be able to witness the pseudo-membranous exudation, suppos-

ed to be pathognomic of it." There may be, corresponding to occasional violent cases of scarlet fever, "a deadly pallor of the surface, a dusky hue of the countenance, and particularly of the lips, a soft, irregular pulse, tongue moist and livid, pupils dilated, drowsiness, urine limpid, often suppressed; no complaint of local pain, and an air of indifference when roused from stupor. In such cases death will take place within four hours. This form of diphtheria is rare."

2. Another form, scarcely less malignant, is more frequently met with. "The subject of it, generally a child, perhaps retires to rest apparently in its usual health. In the middle of the night, or rather towards morning, it awakes with a sense of distressing nausea, followed by vomiting of a thin, whitish, glairy fluid. Then there is a purging of something similar, but particularly offensive. The child most probably does not complain of uneasiness in the throat; he is drowsy, and seems disinclined to answer questions. The face is palid, and the expression altered. On examination, we are struck with a shining crimson appearance of the mucous membrane of the fauces. From the velum a tenacious, thin sheet of translucent mucus hangs like a curtain over the base of the tongue, the papillæ of which are tumified, its surface dry, clean and red. The pulse is rapid, irregular and compressible. The skin may be warm, though more generally it will be found cool. After a lapse of some hours reaction takes place; and now there is a difficulty of deglutition. Drowsiness is succeeded by delirium; respiration is more frequent. The neck is swollen, hard and tender, chiefly in the parotid and submaxillary regions. The anterior half of the tongue may be clean, but posteriorly it is coated with a thick fur, which sometimes is continued to its tip. The whole of the fauces is covered with a deposit like wash-leather. One or both tonsils swelled; breath offensive; a thin sanies issuing from the nares. There may be epistaxis and bleeding from the gums. At first, the urine is limpid; but should the attack not terminate in death within twenty-four hours, it becomes more colored, and there will be a deposit of lithates; at a later stage it is albuminous, and contains the coloring matter of the blood; petechial spots form on the surface, diarrhœa sets in, or if it has been persistent from the beginning, the discharges become altered in appearance, being like what we occasionally see towards

the close of dysenteric cases; serous, like the washings of flesh, and accompanied by intolerable factor. The surface grows cold, and either coma or a tetanic convulsion terminates life, generally within four days. Few cases of this kind escape; and fortunately it is not the usual type of diphtheria, even when malignant."

3. "The malignant form most familiar with practitioners commences with a sense of lassitude preceding a variable amount of fever and slight soreness of the throat. The pulse becomes rapid, small and compressible; the tongue is covered with a thick, yellowish, dirty-brown coat; the uvula, velum, and the pharynx are at first of a dusky red; deglutition is painful and difficult; the neck, about the parotid and submaxillary regions, swells; from the nose distils an acrid humor; the voice changes; the breath grows fetid; the breathing, from mechanical obstruction, is stertorous; there is much thirst, and there may be vomiting. In some hours the erysipelatous hue of the fauces is replaced by a deposition as if, as Dr. Blount expressed it, a thin layer of pie-paste was spread over the parts, the edges being thick and abrupt. The urine is scanty and albuminous; debility increases, and the patient sinks exhausted, often retaining to the last the intellect in its integrity. This is the most frequent mode of accession, progress, and termination of malignant diphtheria, and its duration is generally from eight to ten weeks."

4. "The next variety of the disease is what has been termed coupal. In some epidemics, this has been the prevailing type. It does not appear to be attended with the same oppression of the system of those already described. A sense of constriction in the larynx is an early symptom; the accompanying fever is generally sthenic in character, though some such cases have not presented, from beginning to end, pyrexia. The false membrane rapidly extends to the respiratory organs; there is a hoarse, barking cough, with occasional paroxysms of suffocation, and death takes place by asphyxia."

5. "The form most frequently appearing in this country is of a more gradual invasion, and commences with symptoms of catarrh; coryza, slight fever, with headache, and a pain in one or both ears, usually usher in the attack. There is some soreness of the throat without swelling either of the fauces or the glands externally. The appetite is scarcely lessened. There may be diminished energy, but not so

much as to prevent the patient from attending to his usual pursuits. The fauces, on examination, will present one or more insulated patches of a grayish-white pseudo-membrane, not so defined at the edges, nor bordered with the same distinct redness as in the malignant variety, but more shaded off. In this form, which lasts from five to ten days, there may be some albuminuria; and even after the more prominent signs of the disease shall have passed away, albuminuria may for a variable length of time be persistent, and accompanied by an anæmic state of the system."

Dr. John H. Hollister, of Chicago, attributes (*Chicago Med. Exam.*, March, 1860,) the various modifications of the disease to the different physical conditions of those suffering from it. The sthenic form, for instance, presents inflammation of the most decided sthenic character, with remarkably plastic effusion, resulting in the formation of firm and thick false membrane. In one case, this pseudo-plasma was found so perfectly developed as to give, after expulsion, a perfect cast of the trachea and bronchial tubes to a great extent. An asthenic case, on the contrary, may be marked by nothing but a croupy cough, continuing, without any other disturbance, for a number of days. The fauces will be found affected by congestion of a passive character, the tonsils much enlarged, and the whole of the mucous membrane in the posterior part of the mouth of a dark livid color. Slight secretion of mucus; labored respiration. Soon the affected parts change in appearance, become covered with an abundant sanious discharge, asphyxia develops itself, and the patient sinks in a few days.

Prof. Alonzo Clark, in his lecture on diphtherite, before the College of Physicians and Surgeon, of New York, (*Med. and Surg. Reporter*,) divided "all the modes of invasion peculiar to this affection" under two heads: those in which the *constitutional symptoms* are active from the beginning, and those in which the disease makes its invasion *very insidiously*, and only becomes manifest by the appearance of a patch of exudation upon one or other of the tonsils or in the fauces. "In this latter class of cases, the children do not complain of much ill-health; yet it is apparent that they do not feel exactly well, and have, as a rule, not much disposition to play;" they may, however, be found in bed amusing themselves with their playthings. Voice full, perhaps a little hoarse; some coughing; slight glandular swelling on the outside of the throat. A little

patch of membranous exudation on the fauces, sometimes surrounded by a venous injection. Pulse not very rapid, perhaps 100; countenance only a little paler than usual; tongue not particularly covered with any coating, nor dry. In such cases a few cold chills may form the first indication of the disease; the constitutional form commences almost invariably with cold chills; there is high fever, and sometimes vomiting, on the very onset.

"The symptoms of membranous disease," says Dr. B. E. Cotting, of Roxbury, (*Boston Med. and Surg. Jour.*, Sept. 22, 1859,) "are both constitutional and local. The constitutional may be so severe and so rapidly developed as to destroy life before the local have become a source of danger, or they may be so slight as to be overlooked. The local, also, may have the violence, though not the other characteristics of rapid inflammations, or their existence may even be a matter of doubt, until made evident by obstruction, caused by the membrane fully formed. It is a self-limited disease, having its beginning, middle and ending, as marked and uniform in progress, and as uncontrolled by any means now known, as variola, measles, or any other disease that can be cited. The formation of the membrane (as constant a condition as the eruption in variola) does not always correspond in amount to the severity of the other symptoms, general or local,—in this also resembling the diseases alluded to. The membrane may be only a thin film, or it may have the thickness and toughness of moistened parchment; it may cover only a very limited space, or it may occupy the whole mucous surface of the organs attacked. It usually forms gradually, being at first a very thin layer (not unlike the first coat of white paint on a pine board); then this layer becomes thicker and tougher, day by day, until it reaches its limit. Its progress, so far as it has any, is from above downward; and any deviation from this rule is rather apparent than real. From the onset, however, it generally covers all the surface that it ever will during the attack, increasing only in intensity. Its thinness may prevent its being early noticed on parts within sight, though clearly visible at a later period of the disease. During its formative stage it remains firmly adherent to the mucous tissue beneath it, so that it is impossible to remove it, even by the most careful dissection. As soon as this stage is completed, usually in four or five days, the membrane begins to loosen from its foundation, and soon becomes entirely

separated; it then creates sufficient irritation and cough to cause its expulsion. Sometimes it is cast off without observation, while at others its ejection is attended with convulsive efforts of the greatest severity. If a portion is artificially removed, previous to this natural separation, another forms in its place."

The false membrane exists in all cases of diphtheria, affirms Dr. Dyas (l. c.), except in those extremely rare ones within the system is at once overwhelmingly oppressed by the attack, and life is extinguished ere time is given for the usual characteristic phenomena to be fully developed. It appears very early, within eight-and-thirty hours from the beginning of the disease, generally on one tonsil, or rather in the sulcus between the anterior pillar and tonsil, like a stain left by nitrite of silver on a mucous surface—a pearl-colored spot on a red ground. Sometimes it appears first on the uvula or velum. It extends more or less rapidly, so as often to cover the tonsils, uvula, velum, pharynx, pillars of the fauces, and base of the tongue, with a continuous layer, in from twenty-four to forty-eight hours. It may pass along the respiratory passages to the bronchial tubes, and even down to the œsophagus—according to some, as far as the cardiac orifice; it has been found following the nasal ducts to the conjunctiva. The mucous membrane of the cheeks and gums, the cutaneous surface, the vulva, and the anus may be its seat. Hence the terms faucial, pharyngeal, pharyngo-laryngeal, or croupal, laryngo-tracheal, buccal, vulval, cutaneous, pharyngo-cutaneous, laryngo-cutaneous diphtheritis. Several of these forms have happened in the same family nearly at the same time, showing that the distinction is immaterial.

Generally the thickness of the membrane increases with its area; this, however, varies from the thinnest imaginable pellicle to two or three lines. It may be firm, or a mere diffuent pulp. Sometimes it is in distinct, dull white patches; at others it is confluent. Occasionally it assumes a light buff, yellowish, ash-colored, or even black appearance.

Diphtheritis may run its course, from beginning to end, to recovery or death, without a single pyretic symptom; when fever accompanies it, the type of it is not always the same, although the tendency is usually to the typhoid. In this country the attendant fever has been frequently of an intermittent character, probably in consequence of prevail-

ing malarious influences; if so, the intermittent ought to be considered as a-complication, rather than a mortification of the original disease.

Among other complications observed are measles, scarlet fever, small-pox, whooping-cough, gastric fever, gastro-enteritis, meningitis, and the various diseases of the throat.

Dr. Daviot did not think pharyngeal diphtheritis contagious; and Dr. Cotting also asserts to have seen no evidence that the disease in general is contagious. The evidence so far collected, however, leaves no room to doubt the truth of the remark made in the *London Lancet* (April, 1859), that "contagion plays the principal part in the propagation of diphtheria." Diphtheritic matter, ejected from the mouth of a patient and lodging in the nostrils of the attending physician, has subjected the latter to severe diphtheritic inflammation, spreading to the pharynx, and inducing extreme prostration of the whole system. Quite a number of similar cases are on record. A boy using a bath in which a diphtheritic patient had been previously, contracted the cutaneous form of the disease. If the morbid matter happens to come in contact with an abraded or a wounded spot of the skin, the characteristic membrane will arise from that spot, inducing also the usual constitutional symptoms, and frequently the affection of the fauces.

There are still some other phases of this singular disease to be considered. Even if the patient has recovered from the immediate effects of the attack, and appears completely convalescent, he may, in several weeks, sink and die without any further well developed symptoms. Latent pneumonia is frequently discovered in the dead body. Amaurosis, strabismus, and presbyopia have been observed as consequences of diphtheritis; but one of its most common sequelæ is paralysis, either partial or general. Two, three weeks, or a month after all traces of the original complaint have disappeared, symptoms of anæmia manifest themselves, and slowly paralytic affections are developed. The first is usually confined to the soft palate, or tongue, characterised by a difficulty of deglutition, and a nasal speech; but this may be wanting. If present, it gives way to more general nervous accidents, sometimes increasing to delirium and convulsions (which must not be confounded with the same symptoms attending the more malignant forms of the disease). But these constitute rather an exception: in most of the cases tending to paralysis, a sense of numbness fol-

lows, in one or both arms, the neck, or lower extremities. There may be also vague pains in the back and elsewhere. Now the strength fails gradually; walking becomes more and more painful, until the upright position is impossible. The upper extremities partake in this weakness, the head sinks on the chest, etc. According to Trousseau, the same alternations may be present as in purely nervous affections; the numbness changing from one hand to the other, or the paralysis attacking the legs alternately. In all cases there is an evident affection of the spinal system. Numbness of the cheeks and nose, or distortions of the face, defective articulation, strabismus, paralysis of the bladder and rectum sometimes supervene. There is no fever, a small pulse, but often a tumultuous action of the heart, with anæmic murmurs. The intellect remains intact, although the mental powers are depressed. Dr. Faure, of Paris, adds that during this paralytic affection sensation is diminished, and sometimes entirely lost, or replaced by formication. In some, sundry parts of the body become œdematous, in others gangrenous; others again are subjected to repeated faintings. If this condition terminates favorably, recovery is very slow, occupying from two to eight months.

Dr. Cooper, of the *San Francisco Med. Press*, (Jan., 1860,) saw many of his patients die suddenly from pyæmia, after recovering sufficiently from attacks of diphtheritis to walk about. In these cases the pulse never arose to its normal standard, and the skin remained colder than natural.

The diagnosis of diphtheritis must be based principally upon the patch-like aplastic exudation, accompanied by marked prostration, and spreading, particularly downwards. Some authors also mention a peculiar "muffled sound of respiration;" with Dr. Cotting this is the principal diagnostic sign. In his words, "It is very difficult to describe the sound. It can only be learned by attentive and frequent observations; yet it is more reliable, and therefore more valuable than all other diagnostic signs. Once in a while it can be detected before any other indication of the disease is manifested—say in the first two or three hours." The absence of membrane within sight is not always sufficient evidence that the disease is not present. In such cases, the general condition of the patient, the frequent and feeble pulse, and the *genius epidemicus* must be our guides. It is then that the sound so much relied on by Cotting may also prove a valuable symptom.

It cannot be difficult to distinguish diphtheritis and scarlet fever, or putrid sore-throat, as there is no eruption, nor ulcer-

ation and sloughing in our disease; or at least the latter but rarely. More important is the diagnosis between diphtheritis and croup; Bretonneau, Duché, Guérin, Baird, Barthez, Rillet, Johnstone, and others defending their identity, and simply designating croup as laryngeal or tracheal diphtheritis, or declaring both to be the same disease, only affecting different portions of the same mucous membrane. But diphtheritis is essentially an asthenic disease, affecting the whole system, thus producing a series of constitutional symptoms; it is epidemic and contagious, while croup lacks all those attributes, being only an inflammatory local affection. In croup there is never the swelling of the lymphatics of the neck, which is a constant attendant upon the diphtheritis, and the pseudo-membrane itself sufficiently separates the two diseases: the origin from patches, the aplastic nature and its spreading far beyond the air-passages, which become affected merely by confluence, are found only in diphtheritis. Croup is, further, almost exclusively confined to children, whereas diphtheritis attacks indiscriminately children, adolescents, and adults. Croup is never followed by paralysis, and kills only in one way—by suffocation; diphtheritis may end in the same manner, but it also induces death by asthenia, and months after the disappearance of all exudation, by its effects on the nervous system. ✓

In regard to the prognosis, Dr. D. Wooster thinks the mild variety, or simple form of the disease (confined to the fauces), is easily controlled; but the severe form (confined with constitutional symptoms and extensive exudation,) only with difficulty, giving an extremely unfavorable prognosis even at the beginning. The gravity of the prognosis in general may be said to be in proportion to the suddenness of invasion, and the signs of congestion. Good symptoms are: the false membranes ceasing to extend, and detaching themselves in shreds; slight febrile symptoms; absence of stupor; an unaffected pulse; a soft and moderately warm surface; expression not altered; unchanged color of face and lips; neck and papillæ of the tongue not swollen; no oedema of the fauces. In no disease, however, amendment is more fallacious; we can not, either from a particular sign or assemblage of symptoms, calculate with some approximation at certainty what the termination may be. The disease may have commenced without any indication of particular danger, may develop itself in an apparently mild form; and there may even be a manifest improvement in any symptom, the little sufferer perhaps sitting up, smiling, eating, drinking, amusing himself; suddenly ✓

croupy symptoms supervene, or re-appear to end only with life. The disease has extended from the pharynx to the respiratory passages, and death is the result of asphyxia. This may also be produced without affection of the larynx, either by the swollen condition of the fauces, tonsils, and cervical glands, in combination with abstraction of the nares and altered innervation, or by a congested state of the lungs frequently accompanying the malignant forms.

Nausea and vomiting, or convulsions in the beginning of the disease, a rapid extension of the exudation to the posterior nares, a sense of constriction in the larynx, disagreeable odor of the breath, a croupy sound of the respiration, great enlargement of the cervical glands, are among the symptoms of fatal significance.

Life may be destroyed even after the whole membrane has been thrown off. The excessive and unremitting exertions in breathing, caused by the obstruction offered to free respiration, as well as the intense constitutional disturbance, are apt to exhaust the vital power, without suffocation. Complications generally tend to produce an equally fatal result. The superceding paralysis is frequently but not always removed by a proper treatment.

On the whole, the disease is, as Dr. Wooster says, one of the most decidedly fatal ones. The chance for a favorable recovery among children is about one in three, according to Dr. Cotting; Dr. A. S. Clark thinks nine out of ten cases will recover, even with the malignant, from under an appropriate treatment. Admitting the influence of the curative means employed, there is still a formidable mortality unavoidably connected with the disease, though the number of deaths varies during different epidemics.

The post mortem examinations usually reveal a deep red or livid appearance of the mucous membrane of the palate, pharynx and adjacent part, more or less extensive. In most cases the palate, tonsils, upper part of pharynx, epiglottis, bronchial tubes, sometimes the internal surface of the œsophagus, the pituitary membrane, or some of these parts, perhaps the trachea alone, are found invested with false membranes. Seldom gangrene or ulceration is manifest. The lungs may exhibit patches of hepatization or purulent infiltration; and there may be more or less congestion elsewhere. Occasionally, blood is seen extravasated in the muscular tissue of the heart, and the kidneys often bear the marks of disease. The viscera are frequently dotted over with petechial spots.

Dr. A. Jacobi, of New York, declares the diphtheritic membrane homogenous in structure to the pseudo-plasma of croup; but this seems to be a mistake. The great difference between them is, that the diphtheritic exudation appears to be incapable of organization, and never tends to organic union with the subjacent tissues. Dr. Cotting describes it as of a peculiar structure: "a tissue of elastic fibres longitudinally arranged, the fibres smooth, and in no way transversely striated. Great elasticity is one of its characteristics."

Dr. Laycock found a parasitic fungus (*oidium albicans*) in this membrane, and supposed, therefore, that the disease originated from the parasite; but its presence it thought to be merely accidental.

The nature of diphtheritis is not entirely clear. It is now pretty generally admitted to be a constitutional affection, of an asthenic character, with prominent local manifestations, principally in the throat, resulting in the exudation of an inorganic pseudo-membrane. The disease is the result of a distinct influence (diphtheritic miasm,) contaminating the blood, infecting the whole system with morbid poison. The conjecture of Dr. Dyas, who considers a morbid impression on the par vagum as one of the principal features of diphtheritis, needs confirmation. ✓

In accordance with this view, the therapeutical indications are the elimination or neutralization of the offensive matter, whatever it may be, the correction and mitigation of the local symptoms, and the support of the system, where necessary. Consequently, a general or constitutional and a local treatment is required, with strict dietetic measures.

Daviot, Meigs and others have practiced general and local bleeding, not without success; the general character of the disease, however, during the last few years, and especially on this continent, has been such as to forbid blood-letting in any form; and it is at present looked upon as inadmissible. The croupal form predominating at the time of Bretonneau, seemed to offer an indication not now appearing. The same may be said of mercury, in spite of the many advocates calomel has found up to this day. Whenever the complaint extended to the larynx and trachea, Bretonneau placed his chief reliance on calomel, in three grain doses every hour, combined with mercurial frictions over the neck, arms and chest, repeated every three hours. The most extensive use

of it is made by Dr. I. Maranda, of New Carlisle, Ohio, (*Cinc. Lanc. and Obs.*, March, 1860.) To the strong, the robust, the plethoric patient, and in cases distinguished by high arterial excitement, he prescribes it with jalap in full purgative doses, following with the usual remedies against high febrile action. To those of a feeble constitution, or where marks of prostration are apparent, he gives calomel in alterative doses, conjoined with opium and ipecacuanha, or with camphorated Dover's powder, until there is an evacuation of green stools. When croupal symptoms supervene, calomel in small but often repeated doses is Dr. Meranda's remedy; and in some chronic cases he maintains to have observed the happiest effects follow a moderate salivation. In a case detailed by Prof. Hollister, (*Chi. Med. Exam.*, Feb., 1860,) powders of calomel and ipecacuanha play also a prominent part. Daviot, however, who wrote one of the best monographs on diphtheritis, looks on calomel as useless in pharyngeal, but particularly serviceable in the cutaneous variety. Dr. Briggs, of Virginia, and Dr. Anderson, of New York, admit it in small doses, two or three grains, the last named in combination with prepared chalk, in slight cases; while Dr. G. W. Claiborne (*Virginia Med. Journ.*, Oct., 1859,) declares it to be a good remedy to commence the treatment with and prepare the organism for a tonic course, where "a foul tongue and offensive breath indicate disordered secretions of the primæ viæ." In the opinion of Prof. Alonzo Clark, "the application of dry calomel to the ulcerations of the throat is of decided benefit; but the administration of mercury, with a view of obtaining its constitutional effects, is a doubtful expedient." A similar practice of Dr. Bigelow will be mentioned hereafter.—By far the most practitioners think rather unfavorable of mercurials in diphtheritis; and its inefficacy in many cases has been clearly proven. Even as an evacuant, the propriety of administering it in diphtheritis is at best questionable.

The recommendation of cathartics is very limited, Dr. A. S. Clark (*Ohio Med. and Surg. Journ.*, May, 1860,) being almost the only one who insists in their use. In mild cases he orders a dose of sulphate of magnesia, or some other saline cathartic; but in cases of high fever, where "an active cathartic" is wanted, "that will stimulate the secretions, and at the same time not depress the vital powers," calomel is given, together with ipecacuanha, carbonate of ammonia,

and soda, followed, if necessary, with Rochelle salts, or any other saline cathartics. The drastic cathartics are universally objected to. Dr. S. M. Bigelow, of Paris, in his excellent letter on diphtheritis addressed to Prof. Warren Stone, of Louisiana, (*New Orleans Med. and Surg. Journ.*, Jan., 1860,) mentions the citrate of magnesia, six or eight drachms, to be given every two hours until it operates. Equal if not better, is the advice of Dr. D. Wooster, of California, (*Pacific Med. and Surg. Journ.*, 1859,) and Wm. L. Wells, of Wisconsin, (*Chic. Med. Exam.*, April, 1860;) to select either the mildest laxatives, or employ injections, so as to move the bowels once a day.

"I protest," writes Dr. Bigelow, "in the most serious manner, against the use of emetics in angine couenneuse," and they are certainly never plainly indicated. Nevertheless, they have been pronounced by some occasionally serviceable at the period of invasion of the disease, especially in young children, and when the false membrane extends to the trachea; others, on a more rational basis, will not admit them, except when their mechanical action might assist in detaching the membrane. In either case, neither antimony nor ipecacuanha should be used, on account of their depressing effects. (Wooster's plan, to commence with ipecacuanha in full doses and repeat them for two or three days, seems not to have been followed anywhere.) Drs. Meigs and Pollard used alum as an emetic, a teaspoonful mixed with molasses, repeating that dose in the course of ten or twenty minutes, if required. But the turpeth mineral (sulphate of mercury,) first recommended by Dr. Hubbard, of Maine, is now acknowledged as the best emetic in diphtheritis. It never induces catharsis, and is not followed by prostration, while it operates promptly and certainly. Two or three grains may be given to a child of two years every ten or fifteen minutes, until vomiting takes place. Both alum and turpeth mineral are well suited to patients above one year; for smaller children perhaps some preparation of squill would be preferable (Dr. Dyas.)

The most prominent amongst the remedies employed as directly counteracting the morbid influence is the chlorate of potash, alone or combined with hydrochloric acid, iron and ether. Dr. Bigelow administers every three hours ten grains of the chlorate and ten grains of the bichlorate, in some convenient vehicle, giving at the same time one-tenth of a grain of calomel with sugar, to be put dry upon the tongue, once in one or two hours or less frequent, sometimes omitting the calomel altogether for a while, according to circumstances.—

Chlorate of potash with hydrochloric acid has been recommended by Dr. Kingsford (*Lancet*, Jan., 1859;) Dr. I. Meranda prescribes two drachms of the chlorate with one fluid drachm of hydrochloric acid in eight fluid ounces of water, half an ounce to be taken every three hours. This formula was originally given by Dr. Lambden (*Lancet*, Nov. 1858;) it contains free chlorine in solution. The chlorate and quinine in full doses constitute the treatment of Dr. Barker, New York. Dr. Jacobi gives from a half to one drachm per day to a child from six months to four years old, three drachms to those above that age, continuing for weeks and even months. He usually adds iron, the muriatic tincture in preference. Finding in severe cases the chlorate to operate too slowly alone, he also combines it or precedes it with a few large doses of quinine. The best form, in his judgement, is the solution in water with the addition of some acid, generally the muriatic. Dr. A. S. Clark approves of the free use of chlorate of potash and sesquichloride of iron in tincture, diluted with nitrous ether, but he prefers the following formula; chlorate of potash, one ounce; syrup of lemons, water, of each, four ounces; sulphate of morphine, two grains. Take a tablespoonful every four or five hours.

In Wisconsin, the tincture of the sesquichloride of iron, the hydrochloric acid and the chlorate of potash were given together in a convenient vehicle, or alternately in full doses.— Sometimes the tincture of iron cannot be borne for many days; then the sulphate of quinine with citrate of iron ought to be substituted (Dr. Wm. L. Wells.) The "Lancet Commission" placed the most reliance in a mixture of sesquichloride of iron with chlorate of potash, chloric ether and hydrochloric acid, sweetened with syrup. The chlorate may also be given after the method of Dr. Gardner, of New York, in a syrup saturated with it, a teaspoonful in four hours, alternately with three drops of perchloride of iron in syrup. Nothing else is required in cases without local affection.

But notwithstanding this general adoption of the chlorate of potash, some doubts in regard to its efficacy have been expressed, especially by American practitioners. Prof. Alonzo Clark says it is not, as claimed, a specific in this disease, but still of some benefit, and should therefore form a part of our treatment. In the able article of Dr. Dyas occurs the following passage: "It is very much a matter of conjecture how chlorate of potash acts on the human organism, and in the whole it is doubtful if it possesses a great deal of therapeutic value in diphtheria. It may be prescribed in combination with some

bitter infusion (cascarilla, gentian, or bark,) in doses from ten to thirty grains, according to age." Most summarily Dr. Wooster disposes of it; he believes the chlorate of potash harmless, but unproved efficacy, simply mitigating the factor of expiration.

The declining reputation of this remedy is apparently to be transferred to the muriate and sesquichloride of iron, heretofore only employed as adjuvants and tonics. In the latter quality, Dyas speaks of Thompson's bitter wine of iron, containing one grain of Wetherell's precipitated extract of bark and two grains of citrate of iron in a teaspoonful of cherry wine; but some prefer the tincture of the sesquichloride of iron, "ten or fifteen drops every third or fourth hour." Dr. F. Isnard warmly recommends (*Gaz. des Hop., Amer. Ned. Monthly*, March, 1860,) the perchloride of iron as specific against croup and diphtheritis. It should be administered as soon as possible, in large doses, and continued at all stages of the disease. Dr. Th. Heckstall Smith, (*Braithwaite's Retrospect*, Jan., 1860,) while relying chiefly on gallic acid, found the sesquichloride of iron tincture far superior to anything; and Dr. W. H. Ranking (*Ranking's Abstract*, No. 29,) confirms the value of this tincture as an internal remedy in diphtheritis. If so, the treatment of this disease would be materially simplified; in most of the present methods too many remedies are administered promiscuously.

In a monograph on scarlatina and diphtheria, (London, 1859,) which he considers as one and the same thing, Dr. George Hull praises the sesqui-carbonate of ammonia as a specific, in doses from two to ten grains, every two, three or four hours. Baron treated before him (*Gaz. de Paris*, 5, 1856) diphtheritis with Vichy water and bicarbonate of soda.

A composition called "ferruginated cod-liver oil," has been proposed by Dr. D. Wooster, two fluid drachms with one of brandy, to be taken four or five times a day, or oftener, if the stomach will bear it.

To meet the second indication a large number of topical applications have been employed, without due consideration of the question how far, if ever, it was practicable or necessary to remove the false membrane. Dr. Biglow always removes, with a long forceps, or by scraping, or by any other means, violent or gentle, all accessible portions of it. Dr. Cotting, on the other hand, found that harsh attempts by emetics, probangs and the like, to dislodge the membrane before its natural separation, are often accompanied by fearful risks; and could it be effected, it would involve a re-formation, more to

be dreaded in the exhausted state of the patient than its first appearing. Dr. Wells also removes the membrane with the forceps, where it can be done, which is rarely the case.

Nitrate of silver in the solid stick, where practicable, or more commonly in strong solution, has been applied most extensively to the throat. Many are of the opinion that it could not be superceded by any other local application: such an assertion, however, will not hold good everywhere. The application in substance is stated to have had occasionally the most serious consequences. Twenty, thirty, forty, sixty grains to an ounce of water have been employed, in the beginning as well as in the most advanced stages of the disease. Prof. Alonzo Clark and Dr. Jacobi, considering the application of the caustic to the membrane itself of no special service, only applied it to the parts immediately around the exudation, so as to prevent the inflammation from spreading, and limit thus the further extension of the membrane.

Bretonneau principally depended on the energetic application of concentrated muriatic acid. It has been employed by others, diluted or not, in very young children mixed with an equal quantity of honey. Equal parts of hydrochloric acid and tincture of myrrh, says Dr. Beardsley, detached the pseudo-membrane most readily, and diminished the liability of its being renewed.

A strong solution of sulphate of copper (one drachm to one ounce of water) may also be applied topically. Used in the same manner, some preparations of iron have been found equally useful. The concentrated solution of the perchloride, or Monsell's salt in powder, or the tincture of the sesquichloride, are declared by Wooster, Wells, Beardsley, Dyas, A. S. Clark and others, to be the most efficacious and valuable of all topical applications.

Dr. J. J. Morgan expresses a great predilection for a saturated solution of acetate of lead (adding one grain of morphine to the ounce,) as a gargle to be applied with a sponge, two or three times in twenty-four hours. At least he commences with it in every instance, and if the disease advances in spite of it, he substitutes the lunar caustic in solution.

Tannin has not been tried sufficiently. Dr. Heighway, of Cincinnati, dissolved two drachms of it in one pint of glycerine, and applied that solution by means of a probang, with good effect. Tannin may also be used alone.

Particularly destructive to the exudation is sulphurous acid (Dr. Heighway, Prof. Comegys;) it is best used in the form of a salt, as the hypophosphide of soda.

Dulmont found (*Gaz. des Hop.*, 47, 1856,) nitrate of silver and muriatic acid insufficient, but lemon juice, painted over, a good application; Homotte added a little alum. Tincture of iodine has been tried about the same time, without giving satisfaction. Upon experiments made by him, Ozanam based in the same year, the conclusion that all pseudo-membranous productions are best destroyed by the alkalies and muriatic acid, and soonest removed by bromine and bromide of potash. Thereupon he recommended that bromide or a bromine-water against diphtheritis, croup and similar affections; but his proposition seems to have met with no favor.

An idea of Dr. A. S. Clark deserves a trial; he thinks glycerine may be employed, in advanced states, between the caustic applications, for its lubricating as well as for its solvent powers.

Strong nitric acid, applied by means of a brush, is the remedy of Prof. Comegys, when there are deep and extensive ulcerations.

Baudelocque used a decoction of bark with chloride of soda as a gargle: Wooster also mentions the solution of chloride of sodium, and Dr. Wells asserts that gargles with chloride of soda and chlorate of potash act undoubtedly as a solvent of the membrane.

Dr. Roche (*Union Medicale*, No. 88; *N. Amer. Med-Chir. Rev.* Nov. 1859,) was very successful with injections containing chloride of sodium. He practices an almost continuous irrigation of the throat, by means of Equisier's irrigator, considering the irrigation the principal curative agent, and therefore employing indifferently solutions containing salt, alum or the chlorates.

In mild cases alum gargles as the only local application have proved sufficient. Gargles with alum and red-oak bark are proposed for severe cases; but tannin and alum seem to be useless, at least in Dr. Well's experience. Bauldelocque applied powdered alum to the nostrils by means of a souffloir; Davoit thought it useful only in the early stage of the affection.

A method mentioned by Dr. Perron (*L'Union*, 53, 1856,) has been revived and modified by Dr. Bigelow. Perron blew alum and sulphate of zinc into the mouth several times a day, using afterwards gargles with alum. Bigelow commences his treatment with an insufflation of one drachm of powdered burnt alum, and repeats that operation as long as a tendency to a formation of the false membrane continues, alternating in the latter time with tannin.

When, after a few days, the fauces become so exceedingly sensitive as to give great pain, Dr. G. W. Claiborne (*Virginia Med. Jour.*, Oct., 1859,) used with good success a wash of borax, honey and myrrh.

Dr. L. S. Briston prefers locally in all cases the employment of mild detergent gargles (*Braithwaite's Retrospect*, Jan., 1860.)

A gentle stimulant, in the form of a mild lotion, say eight grains of iodide of zinc to an ounce of water, is, in the opinion of Dr. W. Judkins, of Cincinnati, all the tropical treatment required.

Dr. S. A. Cartwright employs a local application of his own invention, and expresses himself well satisfied with it (*N. O. Med. and Sur. Jour.*, Nov. 1859.) He infuses for several days in one pint of dilluted alcohol, finely powdered hydrastic root and the powdered bark of the root of the myrica cerifera, of each one ounce; three ounces of gum myrrh, and two drachms of capsicum. "A piece of wool or cotton (this better), fastened to a probang, saturated in the above tincture, is the best thing I have ever found to swab the throat with."

Where the running from the nose is very excessive and offensive, a solution of chlorate of potash or better of chlorate of soda (Dr. Jacobi,) or Labarraque's solution (Dr. Thomas, of New York,) may be injected through the nostrils.

Fumigating the throat with boiling water and vinegar poured on catnip, and Labarraque's solution of chloride of soda added, is a method practiced by Dr. Gordon Buck, of New York. In two cases treated by Dr. Bibbins, of the same location, inhaling the vapor of warm water seemed to benefit the patient the most. Prof. Conegys testifies to the beneficial effect of inhalations of one ounce of sulphuric ether with two drachms of tannic acid, a cloth being wetted with the solution and placed into the mouth.

The opinions of the profession, decided on nearly everything connected with diphtheritis, are most decidedly opposed to each other in reference to external applications. Davoit, for instance, admits rubifacients; Wooster exhorts us never to use liniments or mustard, because they increase the anguish of the patient and do not mitigate the affection. Baudelocque applied blisters to the thigh; Daviot objects to blisters in general as having the serious inconvenience of adding cutaneous to pharyngeal diphtheritis, and Meranka, who has but little confidence in external applications to the throat, informs us that blisters are especially hurtful. Dr. Beardsley experienced no satisfactory results from external revulsives, and Dr.

White, of Cincinnati, declares all external applications in the form of liniments, tincture of iodine, poultices, etc., of no benefit. According to Wooster's directions, in the first stage, while the engorgement is red and hot, cold wet compresses should be applied to the neck; further along, when the engorgement of the throat becomes œdematous, warm fomentations. Dr. G. Hull orders the outside of the neck and throat to be well rubbed with a strong embrocation of ammonia, camphor and opium. A more extensive course is followed by Dr. A. S. Clark, who carries the thing almost too far: he advocates sinapism to the legs, feet, hands and arms, external stimulants to the neck, and as the disease advances, fomentations of hops, poultices, etc.

Instead of all these annoying and troublesome appliances, Dr. S. M. Bigelow puts his patients from the beginning into a tepid bath of one or two hours' duration, and has that repeated every two or three days.

There is another feature in the rational treatment of diphtheritis which claims particular attention. The system is to be supported by a free, energetic and persistent tonic or sustaining constitutional treatment, besides the exhibition of general and local remedies as already specified. All authors agree, that a vigorous course, with tonics and stimulants, is an imperative requirement. Therefore the most generous diet: strong beef-tea, mutton-broth, chicken soup, eggs, wine, brandy, and "whatever other form of nutriment the ingenuity of the surgeon, or the fancy of the patient may suggest" (Lancet Commission.) "We urged," relates Dr. Wells, "and in some cases forced patients to take nourishment, notwithstanding the loss of appetite, amounting in some instances to a disgust for food." Where a sufficient amount of nourishment can not be supplied by injections. ✓

Among the remedies proper, turpentine, camphor, carbonate of ammonia, Peruvian bark, but especially the tinctures of iron and quinine, in doses adapted to the age and condition of the patient, are usually selected. Quinine, with a mineral acid and a little lemon syrup, (Dr. Claiborne,) is a very desirable preparation. Sometimes, however, there seems to be some contraindication to the exhibition of quinine. "When the tongue is foul and the stomach irritable, it is better to withhold or suspend it. Loss of appetite, soft compressible pulse, tremulous tongue, languor and subdued expression are indications for its exhibition" (Dr. Dyas.) A most comprehensive and impressive description of this part of the treatment is furnished by Dr. Bigelow. He says:

"I commence immediately with the use of tonics, stimulants, and the most nourishing possible fluid, animal food. Quinine every three hours in as large doses as can be borne: bitters composed of chinchona, columbo, chamomile, quassia, bitter orange peel, etc., formed into a strong infusion, to which I add brandy and a little syrup :

“R Cortex cinchonæ flavæ cont.,
 Radix gentianæ cont., aa ʒ ij.
 Radix columbæ cont., ʒ ss.
 Cortex aurantii,
 Flores anthemidis,
 Quassia amara, aa ʒ ij.
 Aqua bulliens, O. ij. M., flat infusum;
 Adde: Spiritus vini Galliei, ʒ vj.
 Syrupus aurantii corticis, ʒ iv.

“D.S. To an adult, one-half to two-thirds of an ounce five or six times in twenty-four hours.

“Strong bouillon of beef, mutton and chicken cooked together, with tapioca or vermicelli as a change, a teacupful every three or four hours, occasionally with a boiled egg. Ale, porter, sherry, brandy and water in such quantities as may be borne. During recovery I add to our already nourishing fluid diet solids, such as beef-steaks, roast-beef, mutton-chops, poultry, game, vegetables, etc. Throughout the whole course of the disease I give an abundance of such fruits as peaches, grapes, apricots, cherries, currants, raspberries, strawberries. Lemonade and morsels of ice as beverage, or soda-water and syrup of raspberries, currants, and gooseberries.”

A constant supply of fresh air must not be overlooked, nor that all-important care, with the whole train of minor services, usually included in the phrase “*good nursing*.”

A few peculiar methods of treatment remain to be noticed.

During the epidemic in Augusta, in 1848, Dr. Campbell, observing that the accompanying fever was paroxysmal in character, adopted an anti-periodic medication, which proved more successful than the method previously employed.

Dr. C. Swaby Smith, of Burbage, (*Braithw. Retros.*, Jan., 1860,) commences with the application of a strong solution of chlorinated soda to the fauces, and a sinapism to the throat. A gargle, containing two ounces of a solution of chlorinated soda, two drachms of the tincture of myrrh, and six ounces of water, is to be used every half hour. Where the children are too young to gargle, the throat may be frequently washed with the same mixture, by means of a piece of sponge. Inter-

nally : chlorate of potash, two drachms ; dilute nitric acid, two drachms ; Battery's solution of cinchona, one drachm ; water, six ounces. About the sixth part (varying according to the patient's age,) to be taken every two hours. If there is much pain in the limbs, a few minims of the tincture of colchicum are added, which addition has proved highly advantageous. The diet to consist of strong beef-tea, port-wine, and all the nourishment the patient can take.

Dr. G. Bottomley, of Croydon, describes (*Braithw. Retros.*, Jan.,) his plan for children as follows :

- ℞ Solutionis chlorini,
 Syrupi simplicis, aa ʒ ss.
 Aquæ distillatæ, q. s. ad. ʒ vj.
 M., fiat gargarisma sæpe utendum.
 ℞ Solutionis chlorinii, gtt. iv.
 Syrupi aurantis, ʒ j.
 Aquæ distillatæ, q. s. ad. ʒ ss.
 M., fiat haustus, secunda quaque hora sumendus.

The dose is increased according to age. Calomel in one grain doses and more. Diet: concentrated jellies, strong beef-tea, wine, etc.

Dr. J. C. S. Jennings, of Malinesburg, (*Braithw.*, Jan.,) has adopted a rather rough treatment, and institutes it invariably in all cases, regardless of sex, age, or incubation of disease. First, an active emetic of antimonial wine, from half an ounce to an ounce, according to age; then free canterization of the throat with solid nitrate of silver; mustard-poultice from ear to ear; the feet and legs plunged into a hot bath, and the patient confined to bed. After the operation of the emetic, a cathartic of calomel and compound extract of colocynth; four hours afterwards this mixture :

- ℞ Quiniæ disulph., ʒ ss.
 Potassæ chloratis, ʒ j.
 Acidi hydrochlorici diluti, ʒ ss.
 Aquæ, ʒ viij.

M., fiat mistura, cujus sumatur pars sexta quartaquaque hora.

At the same time a gargle of chlorine solution is directed to be prepared frequently, by saturating water with the protoxide of chlorine, generated from two parts of chlorate of potass, one of hydrochloric acid, and one of water. The fauces are to be sponged out with this quite frequently.

Greatly at variance with all others is the method detailed by Dr. B. E. Cotting (*Boston Med. and Surg. Jour.*) While

disapproving bleeding, leeches, cupping, blisters, sinapisms, mercurial and drastic purgatives, emetics, cauterizations, he restricts the therapeutical applications to almost nothing. "Mild and nutritious diet, including, if possible, such articles as the patient willingly accepts, is to be preferred to abstinence, certainly to a stimulating course. The inhalation of watery vapor, by an inhaler or other practicable expedient, is often, not always, very agreeable; and if it is not very effective, it is at least without objection. A warm fomentation, or better still, a warm emollient poultice, covering the whole anterior half of the neck, is probably of service. But above all, anodynes, sufficient to subdue restlessness and ensure quietude are the most important agents. The particular form is of little consequence. Dover's powder, or an equivalent containing the strength of a grain of opium and a grain of ipecac to the ounce, is a very convenient form. The ipecac, however, is not important. Mucilaginous drinks are generally acceptable." From his own statements, it appears that Dr. Cotting was not very happy with this lenient treatment, as old as the history of medicine thought it to be.

Stronger still, but far more successful, appears a plan which Prof. E. S. Cooper adopted (*Boston Med. and Surg. Jour.*, Jan. 4, 1860: *Pacific Med. Jour.*, Jan.,) after despairing almost of achieving anything against the fatal disease. With his treatment he lost only one patient out of thirty-one; and this entitles his proposition to a consideration it could otherwise hardly claim, with all its originality. No applications to the throat are used by him. An embrocation of chloroform [three ounces,] cod-liver oil [twelve ounces,] and spirits of turpentine [two ounces,] is applied freely all over the neck, breast and abdomen, upon flannels covered with oil-silk. For internal use he gives this mixture: Ext. glycyrrh., three ounces; acacia gum, one ounce; antim. tart., one grain; sacch. alb. two ounces; aqua, eighteen ounces. Give a wineglassful every two hours to a young child, say two years old, and increase in proportion to age. During this treatment, not a particle of anything else is allowed,—not a drop of water, nor the least nourishment, save what is in the medicine.

Whatever method may be followed, it seems to be essential to continue both general and local treatment for some days after the disappearance of all morbid symptoms.

Experiments with tracheotomy in diphtheritis have not been wanting. On this continent it has been strongly objected to, and is stated to have never been successful. With Bretonneau it was the last resource; he operated three times, saving

one patient. In France the operation has been defended and performed up to the present time. Dr. Bigelow follows Trousseau in recommending it, adding that it must be done earlier than in croup, before the vital powers are too low. A method peculiar to Dr. Bigelow is the insufflation of alum into the pharynx, and as far as managable into the larynx, through the tracheal tubes, immediately after the operation, and repeated according to circumstances.

In conclusion, the sequæ of diphtheritis ought to come in for their share of the treatment; but the reports are in this regard almost too meagre. Dr. Bigelow merely alludes to iron tonics, a generous diet, cold affusions, warm clothing, and exercise in open air, for the cure of the subsequent paralysis. In slight cases, sulphate of zinc and quinia have proved sufficient. According to Dyas, the blood must be supplied with its normal proportion of hæmotosin; and this is to be effected through the agency of preparations of iron, with a generous and supporting diet. Sulphur baths, electricity, preparations of zinc and valerian, are occasionally valuable auxiliaries.—The same treatment will be required for starbismus, presoyopia, and other ailments sometimes following piphtheritis. Dr. Meranda's cure of the first named, by spigelia and calomel (given in consequence of an imagined connexion with worms,) was evidently an accidental occurrence. Jackson's compound syrup of phosphates has been recommended, and Churchill's preparations of the hypophosphites may be still better; but the remedy principally to be relied on, as well for the general and local treatment of diphtheritis itself as for all affections following it, is undoubtedly iron.

Whooping Cough.—We notice in the Semi-Monthly News, that Dr. Harvey A. Hall states he has seen marked and speedy benefit in whooping-cough from the application of one or more blisters, from the size of a crown-piece and upwards, according to the age of the child, to the back of the neck, as high up as possible, and even encroaching a little upon the scalp. In four or five hours the blister ought to be replaced by a warm linseed-meal poultice. Under this treatment the convulsive character of the cough is broken within twenty-four hours. In bad cases a second blister must be applied, when the second one is healed up. Mr. Hall says he has treated a considerable number of cases on this plan, and in only one instance has the blister failed

to produce a decided benefit; but in this case, after a second blister had been applied, the mother reported at her next visit that the child had been better ever since. His constitutional treatment is simple.

Penins. and Indep. Med. Jour.

When whooping-cough has resisted the agents most ordinarily used, the following syrup, which is the formula given by Delahoe, slightly modified, will be used with full success :

Take eight ounces of Mocea or Martinique coffee, slightly browned, in powder; treat by displacement with boiling water, so as to obtain sixteen ounces of infusion. Dissolve in this liquid alcoholic extract of belladonna, alcoholic extract of ipecac, of each one and one-fourth of a drachm; alcoholic extract of cinchona, thirty-six grains; sugar sixteen ounces. Digest on a water-bath and filter.

Dose; For children of three or four years a table-spoonful three times a day; under the age, the dose should be reduced one-half.

"We have experimented very often with this syrup," says Dr. Courbassier, "in localities where whooping-cough appears each year with an epidemic character, and it has rarely failed us."—*Revue & Therap.*

Dr. C. M. Mueller, of Berlin, in 1857, advised (*Journal d. Kinderkrankh.* Nov., Dec.) small doses of morphia in the treatment of whooping-cough, explaining that affection as "pre-eminently a peculiar nervous affection connected with bronchitis." He considered, consequently, the work done as soon as the spasmodic cough was changed into a common catarrhal cough. To corroborate these views, Dr. Edward Smith, of London, was quoted, and he had indeed obtained very favorable results with the same remedy. Mueller commenced, in very young children, with the sixtieth part of a grain, increasing to one-fortieth, or even one thirty-sixth of a grain, until a slight degree of narcotism or drowsiness appeared. The same dose was then given until the whoop had quite ceased.

Dr. Whitehead (*Ranking's Abstract*, July, 1869,) also opposed the notion that whooping-cough was uncontrollable by remedies; but he found belladonna the most effectual agent against it, although opium was not entirely neglected. In simple cases, or when the complicated ones had been reduced to this condition, Dover's powder alone, or with camphor, camphor inhalation, emetics, belladonna and

local irritants were employed; sometimes tincture of opium in place of Dover's powder; always either opium or belladonna was relied on as the principal remedy. 58 cases treated by the opium method, yielded in the average in 28 days, while 67 others were subdued by belladonna in about 22 days each, giving a decided preference to the latter. The treatment by small doses of morphia, seems to be a still better and the most effectual plan.

In a report to the Buffalo Medical Association last August, (New York Monthly Review, and Buffalo Medical Journal, Oct., 1859,) Dr. Cronyn speaks highly of a formula containing cantharides.

Take : Tinct. cinchonæ, four ounces.

Tinct. canthar., three drachms.

Tinct. camph. comp., half an ounce.

Mix. Three times a day a tea-spoonful to be given in a table-spoonful of flax-seed infusion.

In about sixty cases thus treated, the "seven paroxysms of cough disappeared in ten days." Dr. Haynes had before maintained, in the London Lancet, that whooping-cough was as certainly cured with cantharides as chlorosis with iron. From this resulted the so-called "abortive treatment of Dr. Haynes." The strangury is supposed to be necessary to the cure.

Dr. O. C. Gibbs, in noticing the method of Dr. Cronyn, (Amer. Med. Monthly, Dec. 1859,) is inclined to ascribe the curative influence to the cinchona, having himself successfully treated "the worst case we ever saw occurring in an anæmic patient, and complicated with pneumonia and a congenital heart affection," with full doses of quinine and belladonna. He also had, for six years, the best satisfaction from belladonna, in cases of whooping-cough, as recommended by Dr. Jackson, (Amer. Jour. of Med. Sciences, August, 1834,) and Dr. H. Corson, (ibid, Oct., 1852.)

The powdered root of belladonna, one-sixth of a grain twice a day, with sugar, and with intercurrent emetics, has been relied on by Trousseau (Jour. des Connais. Med-Chir., January, 1850.) No cure, however, could be effected in less than three months. Others have employed compound powders containing the extract of belladonna, tannin, benzoic acid and rhubarb.

Dr. Stegmann, in Wernigerode (Horn's Archiv, July, Aug., 1835,) and Froriep (Tagesberichte, Macz, 1850,) pro-

posed the carbonate of iron in the same doses as exhibited against chlorosis. Watson in Glasgow, and Jobert in Chionon, expressed, about 1850, their preferences for the local application of nitrate of silver, in the same way as used in other affections of the larynx. Hydrocyanic acid has also been recommended and will be found sometimes very serviceable.

Dr. Loewenthal, of Berlin, named a rather singular remedy, (Medical Counsellor, January, 1846,) which, however, deserves attention on account of the real good following its use: this is sweet whey in doses of half a table-spoonful and more, several times a day. Previous to exhibiting any of the last named agents, the affected parts ought to be freed from mucus and other impurities by appropriate emetics.—*Cleveland Medical Gazette*.

Incontinence of Urine.—Against the nocturnal incontinence, Debout (Bull. de Ther.) confidently recommends, 32 grammes of mastich in tears, made with a sufficient quantity of simple syrup into 64 or, if the child swallows with difficulty, into 123 pills of boluses; or an electuary may be prepared by substituting honey for the syrup, and this can be given wrapped in a wafer. Children over ten years old should take at least four grammes of the mastich morning and evening, so as to consume the whole quantity in four days; younger patients may be allowed six or eight days for the same amount of medicine. If there is no improvement after this, the whole course ought to be immediately repeated; but it is useless to pursue the medication beyond that.

With this treatment, the successful trials are said to form the exception, generally a cure being effected even with patients eighteen and twenty-four years old, and who had been afflicted with this disgusting infirmity from their infancy. The following powder is extensively employed by the physicians of Lyons, against nocturnal incontinence in children:

Take: Carbonate of iron,	fifteen centigr.
Extract of belladons,	three “
Nux vomica, powdered,	three “

This dose to be taken every day. Dr. Faure says a complete cure generally follows at the end of eight or ten days.

Before the Medical Society of Toulouse, N. Mittet, of Eours, indicated as a remedy more efficacious than any

other, for the incontinence of urine in young people, an electuary compounded by M. Goimand, a dispensing chemist at Goitiers, for the treatment of chlorosis, chlor-anæmia and leucorrhœa:

R.—Pul. cinnam., eleven ounces.

Ferri. limat., thirty-two ounces.

Seal. corn., four and a half ounces.

Mellis. thirty-two ounces.

Mix; sixteen grains to be taken each morning and evening.

This preparation is, of course, applicable in cases of permanent incontinence only, connected with general debility, and not to nocturnal incontinence, which so speedily yields to belladonna, and is referrable to the contractibility of the muscular coat of the bladder being awakened by the heat of the bed.—The Druggist, from Championniere's Journal.

Sun Stroke.

On this subject Dr. L. Ch. Boisliniere, Coroner of St. Louis county, Mo., publishes in the St. Louis Medical and Surgical Journal, for July, a report of seventy-two cases observed by him.

The necropsies in these cases revealed the following conditions:

External appearances: marked lividity of the skin; neck and anterior part of chest became soon of a purple or blue color; in a few hours the abdomen was quite tympanitic, an abundant froth came out of the mouth and nostrils, resembling thick lather, mixed sometimes with a little blood. By pressing upon the chest, blood could be made to flow freely from the mouth and nostrils.

The *lungs* and *heart* were in every case seen to be more or less congested; the right side of the heart and the pulmonary artery generally contained black and liquid blood; left side empty; on section, the lungs were found to contain an abundant quantity of frothy nucus, mixed with more or less arterialized blood. By moderate pressure on the chest, as above observed, this bloody froth could be made to run freely from the mouth and nostrils. So characteristic was this appearance, that from its presence alone many *post mortem* examinations towards the end of the summer were

dispensed with, the jury, before the writer, after a short explanation; being able to make a satisfactory verdict of death by sun stroke.

The *brain* was generally found normal; in a few cases only there was moderate congestion of the superior cerebral veins and of the sinuses. This the author accounts for by the difficulty the blood found in returning from the head to the thoracic organs, already full of venous blood. Occasionally the ventricles of the brain contained a little more serum than usual. This, Dr. B. attributes to the obstacle about the heart and lungs, damming up the blood in the veins of the brain and its sinuses, and causing some of the serum to ooze out. This effusion of serum was often quite remarkable on the surface of the brain under the membranes, where it frequently assumed an opalescent appearance.

Liver and spleen were, as a rule, enlarged; the spleen particularly softened.

The author remarks that these appearances coincide with what has been observed by several distinguished writers, among whom Andral, Russell, Gerhard, and Levick.

Cause.—The cause of sunstroke, according to our author, sustained by the best authorities, without doubt, is a hot and rarified atmosphere—the want of oxygen; for the disease occurs very frequently in houses where, from some cause, the air has become rarified. Several of the deaths reported above by the writer having taken place in low attic rooms, in kitchens or laundries, and in sugar refineries, as observed by Dr. H. H. Swift, (N. Y. Journal of Medicine, vol. xiii, p. 45, 1854.) From these and other observations Dr. B. concludes that rarified, or poorly oxygenated air, is the "*conditio sine qua non*" of sun stroke.

Idolized Glycerine in Skin Diseases.—This solution is prepared after the following formula: R.—Potassii iodidi, et iodini, each dr. i.; glycerinae, f. dr. ij. Add the iodide of potassium to the glycerine, and when solution is effected, add the iodine. A few minutes' agitation will cause a perfect solution.

This solution has the great advantage over alcoholic solutions of not drying; in consequence the surfaces remain supple, and the absorption and the action of the iodine is much prolonged. It should be applied to the affected part

and covered with gutta percha paper, to prevent evaporation and increase the perspiration of the part. It is left untouched for twenty-four hours, and the degree of action regulates its further application of water will readily remove all traces of the solution. This solution occasions pain, which varies in intensity and duration according to the state of the diseased part and the sensitiveness of the patient. There has, however, never been any general inconvenience. On removing the application, the healthy skin has become brown, and the diseased parts paler than before. On ulcerated surfaces, no trace of iodine will be found two hours after its application. Sometimes its action has been so powerful as to produce phlyctene.

The result of Dr. Richter's experiment are, that this solution acts as a caustic; that it has really a heroic action in cases of lupus; that its efficacy is remarkable in non-vascular goitre, scrofulous ulcers, constitutional syphilitic ulcers—doubtful in primitive chancres and eczema, and useless in psoriasis.—*Wener Wed. Wochens Schrift.*

On the Treatment of Rheumatic Affections—By James Abnott, M. D.

In the whole catalogue of diseases there is none which, from the failure of his efforts at cure, gives the Practitioner more annoyance than chronic rheumatism. Though not a dangerous malady, like rheumatic fever, it is so frequent, so painful, so apt to produce a permanent incapacity of using the limbs, and has been so little under the influence of Medical treatment, as to make it a question whether of the two affections it has not constituted the greater evil to humanity. A large proportion of our military pensioners, and of the inmates of our workhouses, consist of those who have thus been rendered capable of earning their livelihood; and as respects the former class, even when the usual remedies for this disease prove unsuccessful, so much time is required for the accomplishment of a cure by them, as often seriously to injure the public service. Acute rheumatism, like most other fevers, runs a determinate course, and this may, doubtless, be frequently shortened by judicious treatment; but no one can foretell the end of chronic rheumatism. When the disease disappears it generally remains a question whether the cure is to be attributed

to the remedy employed or solely to the efforts of Nature. And it is often the most judicious plan to leave the cure to these efforts exclusively, or to attempt nothing more than, by strengthening the system and removing all disturbing influences, to render the *tis medicatrix* adequate to its task.

Among the various purposes served by the new remedial agent, congelation, the most striking, if the most important, is its use in the various form of chronic rheumatism. I do not bring it forward as a remedy which may only occasionally be of service, for this may be affirmed of numerous other plans of treatment, but as one which extensive experience of its use has shown to be capable, in the great majority of instances, of immediately and permanently relieving the pain and subduing the inflammatory condition of the part to which it is applied. Indeed so few have been the cases in which considerable advantage has not been obtained from its use, that I have attributed the apparent failure more to error in the diagnosis or to a complication of rheumatism with other affections, than to the inefficacy of the remedy. It is almost unnecessary to add that this agent can have no influence on any constitutional affection co-existing with that which is local; but the existence of such a general affection is only known by the local symptoms, and when these are permanently removed the disease may be said to be cured.

If this (or indeed any disease) can be cured by the application of local measures, instead of those whose agency pervades the system, the local measures should be preferred. Few internal medicines of an efficient character can be long persisted in without incurring some degree of danger; and, after all, though the whole constitution is pervaded by them, their beneficial action may be limited to the seat of disease. A coroner's inquest was lately held at Chatham to investigate the circumstance of a death caused by an overdose of opium, administered for the cure of rheumatism; and two days ago, I was requested to visit a gentleman dying from an attack of bronchitis, which owed its fatal severity to the extreme debility caused by a protracted course of active medicine for sciatica. A vulgar and pernicious prejudice against local or external remedies is that they "drive the disease inwards;" but when internal remedies succeed in "driving it out," they too often cause, or (as in the instance just mentioned) predispose to, a worse disease in its stead.

Of the *modus operandi* of congelation in chronic rheuma-

tism it may be difficult to afford a satisfactory explanation. Some may deny that there is any new or peculiar action exerted by it, contending that it is only the thorough development of the antiphlogistic and narcotic virtues of cold applications; while others may regard it as only an appropriate mode of producing counter-irritation, or as a combination or succession of these two remedial agencies. A rational explanation of the mode in which a remedy operates is always very desirable, but experience is the only real test of its utility. The following case illustrates the mode of using the remedy, and its usual effects.

A woman, between fifty and sixty years of age, employed as a cook in a gentleman's family, was, after an exposure to cold and dampness, affected with pain, swelling, heat, and slight redness of both ankles. She walked with great difficulty, and her sleep was much disturbed by an increase of pain during the night. There was no fever, nor other symptoms of constitutional disturbance. I saw her nine weeks after the commencement of the disease, and learned that the colchicum, iodine, quinine, and other remedies, which she had taken, had proved of no avail. On the contrary, her sufferings had increased, and it was proposed to send her into the country for change of air. On the 26th of February last, recourse was had to congelation. About three-quarters of a pound of ice, enclosed in a small canvas bag, were, by means of a flat iron, broken into a fine powder, and rapidly mixed with about half their weight of common salt. The mixture was then poured into a piece of gauze, and applied to both sides, successively, of each ankle, while the foot rested on the edge of a basin. The gauze bag covered a circular space of skin of between three and four inches diameter, and was kept in contact with it for about six minutes. During the last half of this period, the skin was white, hard and insensible. When this congelation had ceased, a small quantity of pounded ice was placed across the ankles in order to prevent the smarting which would have otherwise accompanied the returning sensation, and the patient was desired to keep the ice applied for a quarter-of-an-hour, or longer than this, if the smarting should return on its removal.

Circumstances prevented my seeing the patient until the third day afterwards, when she expressed in very energetic terms, her thankfulness for the relief which had been afforded. There had been no return of pain after the

congelation, and consequently no interruption of her rest at night. All that she now felt was a sense of stiffness of the joints. There had been heat and tingling of the skin, particularly on the second day after the frigorific had been used, but this she had quickly removed by sponging the part with iced water. As the congelation had not been kept up so long as it sometimes is, there had been no vesication produced, and, consequently, none of that tenderness of the skin which follows vesications. The stiffness and weakness of the joints continued for some time, but not in such a degree as to prevent her walking; and had the disease been of shorter duration, these effects of it probably would not have existed. On the other hand, when the disease has continued for a very long period, and produced organic change in the joint, though all suffering may be removed, the stiffness will probably be permanent.

The congelation did not last four minutes; for being desirous to avoid vesication of the skin, I should have preferred repeating the milder application to causing this annoyance from one of greater duration. In determining the proper period during which the part should be kept congealed, it is necessary to take into the account the strength of the frigorific mixture employed. A large quantity of well-pounded ice and salt, applied when the materials are acting strongly on each other, will produce a more deeply penetrating and a more lasting cold than a smaller quantity not so well prepared. The only instance which I have known of healing by the first intention being impeded after an operation performed under congelation, proceeded from its having been too long continued when produced by a very powerful frigorific; but even under these circumstances there would probably have been no impediment, had an appropriate mode of dressing the wound been adopted.

To the prevalence of two errors must the imperfection in the treatment of rheumatism be chiefly attributed. One of these is the undue influence which certain theories of the nature of the disease have been permitted to exercise; the other is the false view that has been taken of the disposition which rheumatic inflammation has to extend from one part of the fibrous system to another, or of what has been termed metastasis.

The theory of the nature of acute rheumatism at present in vogue is a plausible one, but it ought not to be relied upon to the degree that would render those lessons of expe-

rience which are apparently contradictory to it less imperative. That an acid exists abnormally in the blood, there can, reasoning from chemical analysis alone, be little doubt; but whether this acid be the cause of the disease, or only one of its numerous effects, or what the importance of each of these effects may be, are points to be yet ascertained. What has been termed by the late Dr. Todd the eliminating mode of treatment, and which mainly consists in the administration of large doses of some alkaline substance, accords with this theory; but the well-attested advantages proceeding from what are known as the bark, opium, and lemon-juice modes of treatment are adverse to it. So, also, though the supposed common causes of rheumatism, cold and moisture, are in favor of the idea that the emunctories of the skin are closed by their influence, the immediate occurrence of this disease, and of the analogous disease, gout, after sprains, wounds, and urethral irritations, would lead to a different conclusion. One of the most severe attacks which I have met with of rheumatic fever, immediately followed the bite of a horse; and one of the severest attacks of gout was the consequence of sudden dilatation or rupture of stricture of the urethra.

The common opinion respecting the metastasis of these diseases is founded partly on imperfect theory. Inflammation of the heart sometimes precedes inflammation of the joints in rheumatism; and is so common an event during the continuance of the disease, that Dr. Watson has only known two cases of rheumatic fever occurring previously to puberty in which the heart was not effected. That rheumatic inflammation of the heart often takes place about the same time that inflammation ceases in a joint, is indisputable; but this coincidence no more shows the connexion of cause and effect, than the occasional coincidence of dreams and events shows that dreams are prophetic. Rheumatic inflammation extends to various parts of the fibrous system, just as common inflammation attacks successively various parts of the respiratory mucous system; and, doubtless, the part last affected may act in some degree as a counter-irritant in removing the inflammation previously existing in other parts. If it be true (and the idea is, to a certain degree, supported by the pathological researches of Dr. Garrod) that the articular inflammation is produced by the deposition of a *materies morbi*, it must follow that, as inflammation so produced would impede this secretion or deposi-

tion, whatever is calculated to moderate or remove it, will, instead of repelling the poison into the blood, not only promote its deposition in the joints, but, by preventing a febrile disturbance of the system from the violence of the local affection, facilitates its excretion by the skin and kidneys. If we take it for granted that rheumatism is a blood disease, we must admit, with Dr. Graves, that the poison, in certain favorable conditions of the system, may pass off by the emunctories without exciting local disturbance—just as electricity may pass from the clouds to the earth without injury to buildings on its surface.

Before concluding, I may mention another circumstance calculated to oppose the general introduction of congelation in chronic rheumatism; I allude to the imperfect manner in which it has been too often used for antiphlogistic and other purposes. To this cause principally I would attribute the failures in its use mentioned in a work on rheumatism recently published by Dr. Fuller. He states that, out of five cases of lumbago in which he employed congelation, there were two failures. As this differs widely from my own experience, I can only explain the difference by the supposition that the remedy was applied by him in a different manner; and this opinion is confirmed by finding it stated in his book, that congelation is objectionable from the pain produced by it both during and after the application. When properly used, the smarting or tingling caused by it is too little to be complained of, and will certainly never be deemed by the patient a counterbalance to the immediate and permanent relief of the suffering from the disease. Dr. Fuller thinks that these failures of two out of five cases supported his theory, that rheumatism of every description arises from lactic acid in the blood, which must be neutralised or expelled by internal medicine. But surely, instead of the two failures, it would have been more reasonable to have adduced the three successful cases as a corroboration of this theory. What appears a metastasis or shifting of inflammation, probably arises from the poison (assuming the truth of the theory) being carried by the *vis mediatrix* to a new outlet or excreting texture, when the previously excreting texture or former outlet has been obstructed or disturbed by inflammation set up by the excreted matter; and, consequently, what would continue or restore the excretion in a joint already affected by removing this disturbing cause, or, in other words, by arresting the inflammation, would ap-

pear well fitted to prevent its extension to other parts. The truth is, however, that there is too great a dissimilarity between the various forms of acute and chronic rheumatism to authorise reliance on reasoning of this description, far less the substitution of such reasoning for the results of experience.

The Laryngoscope of Prof. Czermak. By HUGO STANGENWALD, M. D. (Read before the New York Medico-Chirurgical College, June 14, 1868.

The principal parts of this simple and useful instrument consists of a small metallic mirror attached to a long flexible handle, which is introduced into the cavity of the fauces to aid in physiological and pathological investigations.

The flexibility of the handle allows of the adjustment of the mirror under different angles, and in order to prevent the condensation of watery vapor upon the reflecting surface, it is gently heated over a lamp, or dipped into warm water, before it is introduced into the cavity for observation.

The earliest mention of such an instrument for diagnostic purposes, we find as far back as 1840, in a work on "Practical Surgery," by Robt. Liston, Esq. Under the head of "*Ulcerated Glottis*," Mr. Liston says:

"A view of the parts may be sometimes obtained by means of a speculum—such a glass as is used by dentists on a long stalk—previously dipped into hot water, introduced with its reflecting surface downward, and carried well into the fauces." In November, 1855, M. Garcia published in the *Physiological Magazine and Journal of Science* his "Observations on the Human Voice," in which he published a number of very interesting and accurate experiments, demonstrating the formation of the voice and the position of the vocal organs. After him, in the winter of 1857, Dr. John N. Czermak, Professor, of Physiology, at the University of Pest, in Hungary, commenced his laryngoscopic investigations, respecting the formation of the Arabian guttural sounds, at the same time repeating the experiments of Garcia; and while thus engaged, became aware of the truly practical importance of the instrument for diagnostic purposes. By an article in the *Vienna Medical Weekly*, of March, 1853, he gave the first impulse, by calling the atten-

tion of medical men to the importance of its use, and recommended its adoption as a valuable means of diagnosis. In June of the same year, Dr. Turk, of Vienna, also published his observations on the laryngoscope and its manipulations.

Without entering any further into its history, I shall proceed to describe the second part of the instrument. This consists of a large concave mirror of about 8 to 12 inches focal distance, and three or four inches diameter, arranged on the well known principle of the ophthalmoscope, which serves to reflect the light of an Argand burner, or gas flame, upon the surface of the small metallic mirror, while the latter is held skillfully and carefully in the cavity of the pharynx under a proper angle. The image is observed through the circular aperture in its centre, thus making the centre of reflection at the same time the central point of observation, and consequently losing a very small amount of light. When it is desirable to have both hands free for use, the mirror, freely movable by screws in all directions, is attached to a support of soft wood or orris-root, by means of which it may be firmly held between the teeth, thus enabling the operator to use a spatula, probang, or other surgical instrument, with perfect ease. The use of the spatula, however, will but rarely be necessary; for if the patient puts his tongue far enough forward, so as to form a long central cavity on its surface, continuing all the while to breathe naturally, no great difficulty will be experienced in introducing the mirror into the pharynx; while at the same time, by stretching the tongue forward, the epiglottis will be lifted off from the aperture of the glottis, and by pronouncing forcibly certain sounds, the *cordæ vocales* will be brought into full view.

On pronouncing the long sound *a*, (as in *fate*,) these will be seen to open, allowing the inspection of the parts beneath. After becoming a little accustomed and skilled in the use of the hand holding the small steel mirror, so as not to produce any undue pressure on the parts concerned, which might distress the patient, we find no difficulty in bringing into view such parts as the back of the tongue, the epiglottis, the arythenoid cartilages, the true and false vocal cords, the *ventriculi Morgagni*, and the anterior walls of the larynx and trachea. This would certainly be sufficient inducement to adopt the use of the instrument for diagnosing pathological changes in those parts: but even more may be done by persevering and skillful efforts.

During my recent European tour, I visited Prof. Czermak at Pest, and was invited by him to examine several patients at a private clinique, suffering from polypi, and other diseases of the vocal organs, which could be seen with surprising clearness and distinctness by means of his laryngoscope. Yet the full capability of the instrument appeared in its true bearing, when he proceeded to exhibit to me on himself, not alone the above mentioned parts, but also the whole anterior wall of the trachea, and twice during the course of the evening the *bifurcation of the trachea* itself. The latter could, probably, only be attained by great perseverance and careful training, yet goes to show what might be accomplished by the use of this instrument in skillful hands. I had heard of his ability to show the bifurcation of the trachea before I came to Hungary, but had smiled incredulously at the idea of its being possible to see the same in a living individual, yet I went away convinced and perfectly satisfied on the subject.

While repeating the above experiment, it is necessary to remember the anatomical curve of the trachea, and obviate its convexity forward by resting the back firmly against the corner of a sofa or easy-chair, and bending the head and neck slightly forward. For inspecting the epiglottis and vocal cords merely, the patient is rested in front of the operator, his hands supported upon his knees, the upper part of the body and neck inclining somewhat forward, and the mouth open as wide as possible. The only difficulty in the operation is the amount of skill requisite to manipulate the small mirror, so as to bring the required parts into view, and to get the eye accustomed to the appearance and relative position of the parts when thus shown *reversed*, according to the laws of reflection of light. This, however, is easily acquired after a few experiments. The temperature of the mirror must of course be such as not to cause pain to the patient, and is most conveniently tested by the feeling of the operator before its introduction. When there is great irritability of the parts, several trials may be necessary before we can accomplish our object; yet that sensibility gradually subsides by continued use, and when it is excessive it may be modified by applying previously a solution of nitrate of silver of moderate strength.

I ought also to mention that this instrument, in somewhat modified forms, has been used by Prof. Czermak for examining the posterior wall of the soft palate, the upper wall of

the pharynx, (cavum pharyngo-nasale,) and the nasal cavities, as well as the orifices of the Eustachian tubes, all of which I had the pleasure to witness during my visit. The upper part of the larynx and the lower part of the epiglottis have likewise been examined by means of a very small mirror introduced through the canula of a straight trachea tube, in cases where there existed perfect closure of the glottis from disease. The mirror used for this purpose being necessarily very small, great difficulty was experienced to prevent its cooling too rapidly, till it was found that by covering the reflecting surface by a thin and even layer of a saturated solution of gum-Arabic, this trouble might be avoided for a considerable length of time.

On my return to Paris, M. Charriere requested the use of the present instrument as a pattern, and a number of physicians expressed themselves well satisfied with its performance on my exhibiting the same at the Hospital des Enfants, and several other hospitals at Paris. And since my return the instrument has been frequently used at the office of Dr. Horace Green, No. 12 Clinton Place, where, in a number of instances, it has verified by the sense of sight, and in a most interesting manner, the rational diagnosis previously made.

Perhaps I should add that Mr. Ford, a skillful instrument maker of this city, has also perfectly imitated this instrument after the present pattern, and is now manufacturing the same at his establishment, No. 85 Fulton Street, for the use of the profession.

On Iritis as it Occurs in Syphilitic Infants.

This form of Iritis which is occasionally met with in syphilitic infants, is of great interest to all engaged in the extensive practice of our Profession. Several circumstances combine to make this affection of much greater importance than its admitted rarity might seem to indicate.—Among these may be mentioned, its insidious nature and the ease with which it may be, and usually is, overlooked; its very serious consequences; and, lastly, the facility and certainty with which its destructive effects upon the function of sight may be prevented if a correct diagnosis be early formed. The circumstance that these cases rarely come, in the first instance, under the care of specialists, but are met with by those who, whether in Union practice or otherwise, come in contact with large numbers of the

poor, also tends to make a correct knowledge of the features of this disease, by the Profession at large, of increased importance.

In the pages of this Journal, during the last few years, repeated examples have been adduced. These it is now proposed to collect into a tabular statement, with also the addition of such other cases as are to be found on record elsewhere. The number of the latter is not large. Mr. Lawrence, in the first edition of his work on "Syphilitic Diseases of the Eye," was the first to publish an example of infantile iritis, and since that date—by Mr. Dixon, Dr. Jacob, Messrs. Maunsell and Evanson, and Mr. Walker—about half a dozen others have been placed on record. Is it possible that the discovery of a few others might reward a more detailed search through the journals than the writer has been able to make. It is a fact of some value, however, as denoting the infrequency of the disease, that the best writers on hereditary syphilis omit altogether to mention it.

CONCLUSIONS DEDUCIBLE FROM THE SERIES OF CASES.—1. That the subjects of Infantile Iritis are much more frequently of the female than the male sex. In Cases 2 and 3 in the tabular statement we have no information as to the sex; of the nineteen others, in fourteen the infants were girls, and in five only were they boys. There is no doubt a reason for this.

2. That syphilitic infants are most liable to suffer from Iritis at about the age of five months. The youngest patient in the series before us was seven weeks old at the date of the first attack (Case 21), the oldest sixteen months (Case 14).

3. That Syphilitic Iritis in infants is often symmetrical, but quite as frequently not so. Our cases give nine instances in which both eyes suffered, and eleven in which the disease was limited to one only; probably, however, in not a few of the latter a transitory and unobserved inflammation had occurred in the other eye. In some also it is very likely that the other eye suffered subsequently to the period at which the patient was under observation, since the interval between the attacks in the two eyes was in several instances considerable, and a mercurial cure of the iritis in one by no means preserves against an attack in the other.

4. That Iritis, as it occurs in infants, is seldom complicated, and is attended but by few of the more severe symp-

toms which characterise the disease in the adult. In but very few of the cases was there any haziness of the cornea, a complication very common in the iritis of adults, nor was there usually any marked degree of intolerance of light denoting inflammation of the ciliary muscle and adjacent structures. The absence of sclerotic congestion was also very noticeable in more than half the cases, while in scarcely any did the patients appear to suffer much pain. In a few of the cases the pink zone of sclerotic congestion was well marked, the eye intolerant of light, and the cornea hazy. As a rule, however, the disease may be considered a very insidious one.

5. Notwithstanding the ill-characterised phenomena of acute inflammation, the effusion of lymph is usually very free, and the danger of occlusion of the pupil great.

6. Mercurial treatment is most signally efficacious in curing the disease, and, if recent, in procuring the complete absorption of the effused lymph. In all the cases in which the remedy had a fair chance, the disease promptly yielded to it, and in several in which the effusion was of considerable duration, and apparently organized, it was absorbed under the mercurial influence (see cases 7 and 13).

7. Mercurial treatment previously adopted does not present the occurrence of this form of Iritis. In many of the cases the patients had previously been treated with mercury for other symptoms of hereditary syphilis. In one instance the eye was attacked while the patient was taking mercury for the cure of iritis in that first affected. This I have known occur more than once in adults. In the latter, in two instances, I have seen acute syphilitic iritis set in during actual ptyalism.

8. The subjects of Infantile Iritis, though often puny and cachectic, are also often apparently in good health. The more ill-nourished of the subjects of hereditary syphilis are certainly not those most prone to iritis. In several of the cases given, the patients, despite the presence of individual indications of hereditary taint, were in remarkably good condition. The puny class of syphilitic infants are those in whom the disease falls with its chief stress on the organs of assimilation, on the mucous surfaces or very certainly on the skin.

9. That infants suffering from Iritis almost always show one or other of the well-recognized symptoms of hereditary taint. In the cases before us, the following symptoms were present at the time of the outbreak of iritis:

Psoriasis of the general surface	in 9 cases.
A papular rash	2 “
Psoriasis palmaris	1 “
Erythema marginatum	2 “
“Peeling of the skin”	1 “
Falling of the eyelashes and tinea tarsi	2 “
Snuffles	10 “
Sore mouth and aphthæ	4 “
Condylomata at the anus	5 “

In two instances (Cases 5 and 15) no other specific symptoms existed at the time of the outbreak of the iritis. In these, however, as in almost all the others, there was a history of symptoms of a suspicious character, which had previously occurred and had disappeared.

10. Most of those who suffer from Syphilitic Iritis are infants born within a short period of the date of the primary disease in their parents. In one instance the mother had contracted primary syphilis (from her husband) only three months before the birth of the infant. In another the interval was four, and in a third six months. In five about a year had probably elapsed; and in another five at least two years. In two, judging by the fact that the mother had previously borne a number of children, some of whom had died with suspicious symptoms, the date of the original disease in the father could not be placed nearer than six or seven years. This calculation quite accords with what is observed in the iritis of adults, which, in a great majority of instances, is a secondary—and not a tertiary—symptom.

EDITORIAL AND MISCELLANEOUS.

THE YEAR BOOK OF AMERICAN MEDICINE.

It affords us a very great pleasure, to give place to the circular of Dr. O. C. Gibbs, of Frewsburg, New York. Fearing that some of our readers may have forgotten, what is to be the character of his work, we propose to *mend* his presentation of the subject, by adding what his modesty, and reluctance to occupy space, causes him to withhold. Many of our readers will remember, that in the February number of the present year of this journal, we gave place to a letter addressed “To the President and members of the American Medical Association,” by Professor

L. A. Dugas, of Augusta, Ga., during the session of 1858. This letter earnestly advocates the establishment of "AN AMERICAN ABSTRACT OF MEDICAL SCIENCE," *which should be both comprehensive and compendious, accessible to all readers every where*, which should present a *resume* of all American contributions and rescue American medicine from oblivion, which the ignoring disposition of European cotemporaries would, in time, accomplish for it.

We advocated the measure at that time, in the strongest terms. The idea seemed to take well, both among the readers of journals as well as us, among the journalists themselves: both Dr. Dugas and ourselves received letters on the subject, from several of our ablest *confreres* who proposed to address themselves to the useful undertaking.

The immense labor of the work, the expense attending its preparation, and the difficulty of finding a publisher, we suppose deterred our correspondents from their enterprise; for we have looked in vain, for the first number of this, which we consider the most important of all undertakings in behalf of American medical science and literature.

The proposition of Dr. Dugas had in view the benefit of no one individual, no one college, no one section, but its benevolent design was to extend its advantages to the *entire profession of the United States*, to let every contributor to every medical journal in this new world speak in its pages, to let every American idea in medicine become condensed and crystallized and effectually preserved in the vast show-case of this comprehensive yet compendious arcana. The idea is benevolent—national—patriotic, and when we come to reflect upon it, at a time like the present, the proposition comes like the welcome truce-flag in the din and carnage of the battle field. Let medicine still be national, though blind political palinurusses may run the ship of state into breakers and finally split her spended hull in pieces, on the rocks of secession, disunion, and anarchy!

We have said that the labor and expense of preparing such a resume of American medicine would be great—this cannot be denied. Any one who is familiar with those English works, "Braithwaite's Retrospect" and "Ranking's Abstract," cannot fail to gain some idea of the labor—but these are no fair data of the estimate—for every English medical journal published, we have nearly ten American; with ten times the number of communications and ten times the amount of condensation to make.—Why do foreign ideas and doctrines in medicine gain such ready currency among us and throughout Europe, while American ideas and doctrines are ignored, often sneered at, and sometimes discredited?

There are several good reasons for these results ; it is not that American Physicians are not intelligent or scientific, it is not that their vast country with its variety of climate, soil and morbid influences does not furnish material for medical reports ; it is not that American Physicians are too indolent to report their experience ; it is not that their reports are inelegantly expressed or that they do not reach the eye of the Profession in printed form. None of these influences materially hinder the progress and extension of American medicine. There is as much material afforded ; as much intelligent and accurate observation ; as much energy in collecting facts ; as much elegance in expressing ideas, and as many medical journals printed in the United States as in the whole European continent and British isles put together.

We have indeed too many journals ; American periodical literature is diffused, American ideas are too much divided up, not sufficiently concentrated—it is too great a labor to search for them—and authors and journalists of other countries give it up in despair while but few of our writers have at hand, any reliable source from which they may elicit the American opinion on any single point in medicine. We have no work like that of Braithwaite or Ranking, and hence the evil and injustice to American medicine.

We want a work which will contain a resume of every new idea published during each current year, in any medical journal, any where in the limits of the United States, that will be sufficiently condensed to be transmitted to any part of the world, and yet clear enough and full enough to convey a correct idea of each writer's views. This is the desideratum. This is the work which Dr. Gibbs proposes to publish and for which he claims the assistance of the Profession in every part of the country.

It will be apparent to every one, that, besides labor and the expenditure of money, a thorough acquaintance with the past and current medical literature of our country, and also a peculiar talent, well practiced in the difficult art of condensing fairly and justly, will be required to carry out and perfect this important enterprise. Dr. O. C. Gibbs is eminently fitted in all these respects to carry on the work. For years he has been connected with several of our best Medical Journals, as a reviewer and contributor, and for the past year has been most successfully engaged in the *very kind of labor*, and employing the very kind of talent necessary for the work he has undertaken. His "*Monthly Summary of Cotemporary Medical Journalism*," published in the *American Medical Monthly*, well attests his ability and industry, as well as the utility of this kind of work. The work will not be published unless

a sufficient number of names are sent in before the first of January, 1861, to authorize the undertaking. Subscribers will, therefore, send on their names and addresses to the Editor, that he may know what to depend on. We would think that at least every *American Physician* would gladly secure a copy of the work. We have said enough. We now let Dr. Gibbs speak for himself:

The Undersigned proposes to issue a yearly volume with the following title:—"Year Book of American Contributions to Medical Science and Literature."

It is designed that Part *First* of each volume shall comprise an arranged and classified *Summary* of, and index to, all the important original papers found in the various *Medical Journals* of this country, for the year immediately preceding. Part *Second* will comprise a *Summary* of, and index to, all papers found in the published transactions of the National and the various State Medical Societies. Part *Third* will embrace *Reviews* of all medical books of American authorship, published during the year, with a *Summary* of all the novelties in opinion or practice therein. A copious index will complete the work. To the above plan and arrangement, such other additions shall be made as time and circumstances may suggest. The first volume will be issued early in the year 1861.

For the preparation of our *Monthly Summary of American Medical Journalism* for the *American Medical Monthly*, we have arranged for all the American Medical Journals [over thirty in number] and at least four of the best European. To facilitate our design, we request a *continuance* of the *exchange*.

American authors of medical works, and publishers of the same, are requested to send to our address a copy of their respective works and publications. Medical Societies that publish their transactions, will, we trust, be kind enough to send a copy of the same to our address. For this kindness of an exchange from Journal publishers, authors, book publishers, and Presidents of Societies, we shall be happy to reciprocate by an *exchange of publication*.

The importance of a work of such kind as above, which shall comprise *all there is of interest* in the more thorough journals, medical books issued for the year, and the various society transactions, will be readily conceded by all. We cannot prepare the work and publish it at a pecuniary loss, and hence the object of this circular is to request that all physicians who would encourage the work, and become subscribers to the same, *would send us their names* AT ONCE—payment to be made only on the publication of the work. The work shall contain from 500 to 800 pages, to be substantially bound, and furnished at the very low price of *Three Dollars*. That we may know whether the work is to receive sufficient encouragement to justify its completion and publication, *we request that subscribers' names* MAY BE SENT IN IMMEDIATELY. As a special favor we request that our friends will not allow a day to pass before responding to this Circular.

All Books, Journals, Published Transactions, and Names of Subscribers, should be directed to

O. C. GIBBS, M. D.,
Frewsburg, Chautauqua County, N. Y.