the actual discoveries they report. To satisfy this yearning for artistic completeness, elaborate and tedious disquisitions, and hackneyed principles, and facts long known, are interpolated; and even worse may be, when the imagination helps to create the completeness. Most scientific men harbor a little distrust of French work. This sentiment is further fostered by the almost systematic neglect of German research on the part of the French. Such a frank exhibition of rancor makes one suspect the impartiality of the French in science generally: indeed, we believe that science has never been so depressed in France as at present. Italy is above her; but Italy, with all her innate ability, is striving to learn from Germany, and has already risen high, and will rise higher. We trust and believe that the present phase of French science which abounds in inefficient work will soon end, and the people terminate their present voluntary isolation. The French stay at home: they used to travel abroad much. Let us hope that they will soon resume their ancient habit, and, above all, that they will re-establish mental intercourse with foreigners. There are *savants* in France who are esteemed throughout the scientific world: may their number rapidly increase!

America's contributions to pure science are by no means very extensive, or often very important: compared with the great volume of German production, they seem almost insignificant. We have never duly fostered research, for we have bestowed upon it neither the proper esteem nor office. There are, we suppose, at least six thousand 'professors' in the United States: are one hundred and fifty of them active investigators? The time seems remote when every American professor will be expected to be also an investigator; but among us is a little band of men who have before them the model of Germany, and who are working earnestly for the intellectual elevation of their country. Their first object is necessarily to render research more important in public estimation, and so to smooth the way for a corps of professional investigators. Every thoughtful person must wish success to the attempt.

CLIMATE IN THE CURE OF CONSUMPTION.[1] — II.

Humidity.

THERE is a unanimity of opinion amongst authorities in regard to the relation of moisture to the production of phthisis. The seventh annual report of the registrar-general of Scotland showed that the death-rate from phthisis diminished in proportion to the dryness of the location. Dr. H. I. Bowditch of Boston has shown that phthisis is prevalent in damp soils in the United States. "It is also common in Holland, and other countries liable to damp fogs and an atmosphere saturated with moisture" (Reynold's System of medicine, iii. 548). Ruehle, in Ziemssen, says, "It appears that moist air favors consumption." Dr. Austin Flint says, "It may be stated that the prevalence of the disease is less in climates either uniformly warm and dry or uniformly cold and dry." And Dr. C. T. Williams writes, "As to the desirability of moist climates for consumptive patients, the evidence is decidedly against their use in the treatment of ordinary chronic phthisis."

If we attempt to explain why it is that phthisis is more prevalent in moist climates than in dry, we might assign as a cause the prevalence of germs, or the impurity of the air, containing the effluvia of decay, or perhaps the greater susceptibility of the system to cold in moist climates; or it may be that the air, being so near saturation, cannot take up the requisite amount of the aqueous vapor exhaled from the lungs. *Causa latet vis est nota* may adequately express the state of our knowledge in regard to this point. A moist climate is acknowledged to be a breeder of phthisis; and, *au contraire*, a dry climate is known to afford a certain exemption from the disease. This is shown by the fact that the disease is rare in Iceland, in the island of Morstrand, on the steppes of Kirghis, and in the interior of Egypt; in all of which places the element of elevation is wanting. It may, then, be conceded, that dryness of the air is an important element in the prophylaxis and cure of phthisis.

The method of determining the humidity of the air is that introduced by Regnault, known as the wet- and dry-bulb test. It can easily be seen that the results obtained will depend on the exposure of the thermometers, and on the accuracy of the readings. Moreover, the amount of moisture that the air is capable of

[1] Concluded from No. 34.

holding varies with the atmospheric pressure and temperature.

While it seems to us that a table showing the relative humidity, i.e., the percentage of saturation of the air, would be sufficiently accurate as a basis of comparison, yet, as it might be objected that such a table would be subject to error, we have appended another table, giving the absolute moisture, or the number of grains of vapor to the cubic foot of air. This second table we have computed from Glaisher's tables.

Consulting these tables (table I., columns iii. and iv.), it is seen that Denver and Santa Fé afford a very low relative and absolute amount of atmospheric moisture, — a relative amount, which, as between Denver and Jacksonville, is as 1 to 3, and, as between Denver and Los Angeles, is as 1 to 2.

This proves, that, on the eastern slopes of the Rocky Mountains, we have, in addition to the favorable element of elevation, a second, that of dry air, as an element of climatic influence in the cure of phthisis.

Precipitation.

Closely related to the foregoing, is a consideration of the mean annual precipitation, or the mean annual amount (in inches) of rain and melted snow. Its bearing on our subject is apparent in several ways.

1. Of the precipitation, a certain part is lost by evaporation, and tends to increase the humidity of the air. This amount will depend upon the amount of moisture in the air, or its degree of saturation, and also upon the amount of the precipitation left upon the surface of the ground to be evaporated. It is evident that the greater the porosity of the soil, the greater will be its absorptive power, and the less the evaporation from it. Such a porous soil is found on the eastern slopes of the Rocky Mountains. Loose, sandy, and gravelly, it eagerly drinks up all the rainfall; and such a thing as mud is rarely seen.

2. It is well known that pulmonary troubles are most prevalent during 'thaws,' in those places where the snow lies upon the ground in winter. Now, in the district of the Rocky Mountains under consideration, there is, in the first place, only a slight amount of snowfall, so that sleighing is exceptional, and, in addition, the warm sun soon melts the snow, and the thirsty, porous soil drinks it up; so that the annual 'spring thaw' of our Eastern States is a *res incognita* in this country. The writer remembers very distinctly several snowfalls of fourteen to twenty-two inches on a level, of which there was not a vestige left in ten days; and during that time the air was not chill and raw, and there was but little slush.

3. Further than this, the amount of the precipitation has a bearing upon our subject, as indicating approximately the ability of the invalid to lead an out-of-door life. We shall defer our discussion of this point to a later part of this paper.

Turning, now, to the tables, we see (table I., column v.) that in Denver the mean annual precipitation for a period of ten years is only 14.77 inches in rain and melted snow, — an amount which is only one-fourth of that at Jacksonville, and which, with Santa Fé, gives the smallest showing in our range.

We can therefore add this element of climate to the other two of elevation and dry air as a point in favor of the Rocky Mountains in the cure of phthisis.

Temperature.

The writer in Reynold's System (*op. cit.*) says of this matter of the relation of the temperature of climate to the cure of phthisis, "It was formerly supposed that warm climates were beneficial for consumptive patients. . . . But it will be invariably observed that unaccustomed warmth is injurious. . . . What is really required, is a cool, temperate climate, free from great alterations of temperature." Dr. Austin Flint (*op. cit.*) calls attention to the fact, that "the disease is oftener developed during the spring months and the hot months of summer," when either there is a great deal of moisture in the air, or the debilitating effects of heat are present as factors. On the other hand, Ruehle says that the temperature has "nothing to do with the prevalence of consumption."

It is known that the effect of heat is to raise the body temperature, to lessen the number of respirations, to quicken the pulse, to lessen the digestive powers and the appetite, to diminish the excretion of urea because of the diminishing of the ingesta, and to depress the nervous system, especially if the heat be accompanied with excessive moisture. It seems, then, that it can be stated as a fair inference from the foregoing, that a dry, temperate climate is to be sought by the phthisical invalid. The Rocky Mountains furnish a dry climate. The table (table I., column vi.) shows that the mean temperature is nearly a mean between the extremes in our range. The question will, however, be presented in a better form farther on.

Winds.

The points of importance in regard to the winds are their velocity and direction. It is well known that they are regulated somewhat by changes in atmospheric pressure and temperature.

Velocity. — It is known that a cold wind abstracts body-heat, and in proportion to its velocity. By consulting our tables (table II., part ii.) it will be seen that the mean daily velocity of the winds at Denver is less than it is in the Eastern States; and that as a consequence, while the mean temperature is nearly the same, the chilling effect will be much less. On the other hand, as it has a considerably greater velocity, and as there are fewer calms than at either Augusta or Los Angeles, it has a proportionately greater purifying power in bringing fresh ozone, and in blowing away the products of decomposition.

Direction. — Of more importance than the velocity, is the direction of the winds. The favorable and unfavorable directions vary for different places, according to their geographical location. The east and north winds are known to be the trying ones along the Atlantic coast; and our table shows that the north-east wind is the prevailing one at both Augusta and Jacksonville. The west wind, blowing from the Pacific Ocean, and bringing fogs, is the trying one on the California shore; and the table shows that this is the prevailing one at Los Angeles. The south wind is the salubrious one for the eastern slope of the Rocky Mountains, in Colorado; and our table shows that this is the wind that blows there most frequently.

We can therefore add this element to the others, — of elevation, dryness of air, small amount of precipitation, and mean temperature, — as favorable to the Rocky Mountains as a place for phthisical patients to resort.

Clear, fair, and cloudy days.

We now come to the consideration of our last general point, that is, to an investigation of the number of clear, fair, and cloudy days; or, in other words, to a consideration of the amount of sunshine.

As to the direct effect upon health produced by light and sunshine, we are still in ignorance. Whether the blood is made to course more rapidly, and the nerves transmit impulses more readily, under the influence of the solar ray, is not known. It is well known that the actinic rays have a powerful chemical effect upon vegetation; but whether or not they have a like influence upon the human economy is unknown.

Without attempting to refine, there are certain broad and positive effects in the cure of phthisis attributable to sunshine. The experience of the profession is fittingly expressed by the words of Dr. Austin Flint: "I would rank exercise and out-of-door life far above any known remedies for the cure of the disease."

TABLE II. — WINDS.

STATION.	DIRECTION. MEAN FOR THREE YEARS.									VELOCITY.	PREVAILING WIND.
	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	Mean daily.	Mean 5 years.
Augusta, Ga.	57	154	68	118	86	109	94	120	304	79 miles.	N.E.
Jacksonville, Fla.	77	282	120	116	102	180	83	76	60	159 "	N.E.
Boston, Mass.	70	59	88	72	85	155	286	186	60	238 "	W.
Newport, R.I.	113	80	51	73	112	299	183	164	28	236 "	S.W.
New York, N.Y.	76	136	54	98	83	175	188	290	14	207 "	N.W.
Philadelphia, Penn.	123	157	92	40	102	162	179	208	9	256 "	S.W.
Chicago, Ill.	147	122	85	99	142	239	151	114	30	203 "	S.W.
St. Paul, Minn.	95	37	91	223	72	122	129	223	70	211 "	S.E.
Denver, Col.	150	95	78	150	307	67	76	155	12	145 "	S.
Santa Fé, N. Mex.	139	109	157	100	78	142	59	119	201	152 "	E.
Salt Lake, Utah	81	64	56	252	39	33	49	269	249	135 "	N.W.
Los Angeles, Cal.	104	155	80	58	55	208	274	53	142	103 "	W.

In the table which we present (table III.), and which is a mean of daily observations for a period of five years, a cloudy day is one in which the heavens are from seven-tenths to entirely obscured by clouds; a fair day is one in which the heavens are from four to seven-tenths clouded; all else are classed as clear days. From this it will be seen, that for our purposes clear and fair days may be classed as one, and may be put into juxtaposition with the cloudy days. Consulting these tables, it will be seen, that in Denver the mean number of cloudy days in a year is only one-half of what it is in either Augusta or Jacksonville, that it is less than a half of what it is in St. Paul, and that it is slightly less than what it is in Los Angeles.

TABLE III.

STATION.	MEAN FOR 5 YEARS.		
	Clear.	Fair.	Cloudy.
Augusta, Ga.	123	150	92
Jacksonville, Fla.	126	152	87
Boston, Mass.	105	145	115
Newport, R.I.	108	140	111
New York, N.Y.	101	155	109
Philadelphia, Penn.	114	139	112
Chicago, Ill.	104	154	107
St. Paul, Minn.	103	158	104
Denver, Col.	177	142	46
Santa Fé, N. Mex.	174	148	41
Salt Lake, Utah	141	131	93
Los Angeles, Cal.	164	148	51

To put this fact in another way, it is seen, that in Denver there is only about one-eighth of the entire year when an invalid would be kept in the house on account of the weather; in Jacksonville and Augusta he would be confined to the house, for the same reason, one-quarter of the year; in St. Paul he would be kept in-doors between a third and a quarter of the time; while in Boston he would have to be housed a good third of the time.

Admitting, then, the force of Dr. Flint's statement, our tables show that there is no place in this whole country, where it is possible for the invalid to enjoy so much fresh air and sunshine, as in the Rocky Mountains. For three hundred and twenty days out of every three hundred and sixty-five it is possible to roam at large, and to breathe in health.

We feel, that, so far, our tables have shown that the Rocky Mountains furnish climatic conditions of elevation, humidity, precipitation, temperature, winds, and sunshine, which recommend them as a resort for phthisical invalids superior to any thing to be found in this country.

Observations by seasons.

Having arrived at these general conclusions, the writer wishes to call attention very briefly to their accuracy and importance as applied to the different seasons of the year. He wishes to lay stress upon the evidence which goes to show that Colorado and New Mexico furnish favorable resorts for phthisical invalids during the winter and spring, — the very seasons that are most trying in the east, the seasons that they are obliged to avoid, and to seek new abodes at the resorts. The elements of elevation and barometric pressure will remain nearly constant the year round. But how is it in regard to the *humidity* of the air in Colorado during the winter and spring? The writer has selected at random, and without reference to whether the showings would be favorable or unfavorable for a given place, the year 1880 as his basis for comparison. By referring to table IV., part i., it will be seen, that both the relative and absolute humidity for Denver during the winter and spring is absolutely, and by comparison, very small; that, as compared with Augusta and Jacksonville, it makes a wonderful showing in these respects; and that the ratio of the absolute humidity as between Denver and Los Angeles is as 1 to 3 for these seasons.

When we turn to our tables (table IV., part ii.), we learn that the amount of *precipitation* at Denver for these seasons was almost *nil;* that the mean monthly precipitation at Denver for the given time was only a small fraction of an inch in rain and melted snow. Carry out, now, the comparison between Denver and Augusta, Jacksonville and Los Angeles, and see the tremendous difference in this particular between these places, — a showing immensely in favor of Denver. It will be seen that our general conclusions are very much strengthened by this particular application, and that we have brought strong additional evidence in favor of Colorado as a resort for persons affected with phthisis pulmonalis.

When we turn to our tables to learn in regard to the *winds* at these places for the given seasons, we see that the conclusions previously reached in regard to Denver, in this particular, still hold true (table V.).

Temperature. — We come now to our last observation, and to a brief discussion of what some may consider the weak point in regard

TABLE IV.

STATION.	1880. RELATIVE AND ABSOLUTE HUMIDITY.								1880. PRECIPITATION.			
	Spring.		Summer.		Autumn.		Winter.					
	R. H.[1]	G. V.[2]	R. H.	G. V.	R. H.	G. V.	R. H.	G. V.	Spring.	Summer.	Autumn.	Winter.
Augusta, Ga.	68	4.7	64	7.2	74	4.9	72	3.2	5.0	4.2	2.8	3.9
Jacksonville, Fla.	66	5.5	69	8.0	75	5.6	70	3.0	3.5	5.9	9.5	3.5
Boston, Mass.	61	2.5	70	5.4	67	3.0	69	1.5	2.6	3.5	2.6	3.8
Newport, R.I.	71	2.7	76	5.9	75	3.5	76	1.9	3.9	5.0	3.4	3.6
New York, N.Y.	65	2.9	79	5.5	70	3.8	65	2.0	2.5	4.2	2.5	2.8
Philadelphia, Penn.	61	2.7	66	6.1	68	3.0	72	2.1	2.1	4.8	1.5	2.6
Chicago, Ill.	63	2.9	70	5.9	66	2.3	69	1.8	4.1	3.7	2.1	2.4
St. Paul, Minn.	62	2.9	69	5.1	66	2.9	71	–	2.1	4.0	2.3	1.5
Denver, Col.	37	1.1	43	3.3	55	2.3	51	0.9	0.5	1.3	1.0	0.2
Santa Fé, N. Mex.	35	1.2	36	2.6	50	2.5	50	–	0.2	1.7	0.7	0.6
Salt Lake, Utah	41	1.5	25	1.5	33	1.6	50	1.3	1.6	0.3	0.7	1.1
Los Angeles, Cal.	74	3.6	73	4.8	63	3.8	68	2.9	2.2	0.6	0.3	3.8

[1] Relative humidity. [2] Grains vapor.

to Colorado as a resort for invalids. It has been seen that most authorities favor a cold climate; but they add the proviso that it should be free from change. By consulting table VI., part ii., it will be seen that the mean monthly range of temperature is larger for Denver than for almost any other point in our scale. It will be seen, further, that the minima (table VI., part i.) of temperature are very nearly the lowest in the scale, — not so low, to be sure, as the minima at St. Paul, but decidedly lower than at Augusta, Jacksonville, and Los Angeles. This state of affairs demands an explanation.

We have seen that the air of Colorado is both dry and rare, — two conditions that favor rapid radiation. We have seen, further, that the soil is of a porous, sandy nature, — a kind

TABLE V. — WINDS, 1880.

STATION.	DIRECTION.				VELOCITY, MEAN DAILY.			
	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
Augusta, Ga.	S.E.	S.E.	N.E.	N.W.	102	77	67	101
Jacksonville, Fla.	N.E.	S.W.	N.E.	N.E.	226	162	157	189
Boston, Mass.	S.W.	S.W.	W.	N.W.	257	184	223	281
Newport, R.I.	S.W.	S.W.	S.W.	S.W.	243	168	232	266
New York, N.Y.	N.W.	S.W.	N.W.	N.W.	247	177	192	222
Philadelphia, Penn.	S.W.	S.W.	N.W.	S.W.	294	218	228	178
Chicago, Ill.	S.W.	S.W.	S.W.	S.W.	182	183	217	193
St. Paul, Minn.	S.E.	S.E.	N.W.	S.E.	210	180	189	193
Denver, Col.	S.	S.	S.	S.	156	143	115	127
Santa Fé, N. Mex.	S.W.	N.E.	N.E.	N.W.	167	134	140	148
Salt Lake, Utah	S.E.	N.W.	S.E.	S.E.	122	130	102	103
Los Angeles, Cal.	S.W.	W.	W.	N.E.	187	131	78	112

TABLE VI. — TEMPERATURE, 1880.

STATION.	SPRING.		SUMMER.		AUTUMN.		WINTER.		SPRING.		SUMMER.		AUTUMN.		WINTER.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Range.	Mean.	Range.	Mean.	Range.	Mean.	Range.	Mean.
Augusta, Ga.	90	35	99	60	91	28	81	7	47	66	32	81	45	63	54	51
Jacksonville, Fla.	95	42	100	69	91	39	78	19	43	71	29	82	39	69	45	59
Boston, Mass.	92	12	101	47	93	3	59	— 5	58	47	48	69	52	51	52	33
Newport, R.I.	84	14	88	49	87	15	61	1	44	47	33	69	42	53	48	36
New York, N.Y.	94	16	92	48	91	14	65	— 6	54	51	36	72	45	53	52	36
Philadelphia, Penn.	96	20	95	51	91	10	67	— 5	56	54	37	75	49	55	53	37
Chicago, Ill.	85	19	95	52	85	1	63	—15	47	51	42	72	53	48	57	31
St. Paul, Minn.	91	— 7	98	47	90	—18	59	—27	59	46	43	69	62	42	67	21
Denver, Col.	89	—10	96	39	89	—13	59	—11	66	48	48	69	60	44	72	29
Santa Fé, N. Mex.	80	0	88	33	80	—11	56	— 3	67	47	45	66	59	48	61	27
Salt Lake, Utah	78	5	95	40	88	3	49	2	51	45	51	68	51	49	44	31
Los Angeles, Cal.	97	36	87	50	91	35	80	30	45	56	38	64	47	61	46	54

that will easily absorb heat, and as easily give it off. Furthermore, there is but little verdure or shade, — another condition, too, which will favor both absorption and radiation of heat. In consequence of these conditions, the soil and air are, on the one hand, rapidly heated in the morning, and they are equally rapidly cooled at night. The nights are always cool in Colorado, — a condition that renders the summer months enjoyable and invigorating. But the question, after all, is, whether this diurnal change of temperature is injurious to Colorado as a resort for invalids. We claim that it is not, and for this reason: it makes but little difference to the invalid how cold the nights are, for at that time he should be indoors, where he can regulate the temperature; but it is of importance that it should be warm at mid-day, so that he can take his exercise regularly and comfortably. We have seen, that so far as conditions of sunshine, humidity, and rain and snow fall are concerned, the invalid can lead an out-of-door life a greater percentage of the time in Colorado than anywhere else in this country; and we claim that he will never find these factors counterbalanced by the element of temperature. An experience of several years warrants the writer in asserting that an invalid can, with perfect comfort and safety, spend several hours in the saddle nearly every day of the three hundred and sixty-five. One has but to read 'H. H.'s' writings to learn how attractive out-of-door life is in Colorado, even in mid-winter; and we can positively assert that we have known of picnics being held day after day, in the open air, in the very heart of the winter, and that there are days and weeks in mid-winter when one can sit with doors and windows open.

As proof of what we say, we append the mid-day temperature at Denver for each month of the year for three years.

In conclusion, the writer would state, that while his personal experience in regard to a desirable climate for the cure of phthisis has been such as to convince him of the great superiority of the climate of the Rocky Moun-

TABLE VII. — DENVER, MEAN MONTHLY TEMPERATURE, 1 P.M.

YEAR.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1880	45°.7	37°.6	44°.3	56°.7	67°.2	78°.5	79°.9	79°.6	71°.3	56°.8	30°.3	35°.8
1881	33 .5	36 .4	46 .1	62 .2	69	82 .5	84 .6	81 .3	70	59 .7	42 .8	47 .6
1882	37	46 .2	52 .3	55 .5	59 .3	73	81 .6	81 .4	73 .9	59 .4	46 .5	43 .2

tains over any other in this country, yet in this article he has tried to put aside any personal bias, and he desires to carry conviction only in so far as he has been able to adduce facts, and to interpret them rationally and logically. He would state, further, that, if the reader should take exception to any interpretation given to the facts, the tables still stand as the best and most reliable data of these facts attainable, and they are not to be controverted.

SAML. AUG. FISK, M.D.

Denver, Col.

REARING OYSTERS FROM ARTIFICIALLY FERTILIZED EGGS AT STOCKTON, MD.

IN order to test the feasibility of such an undertaking on a considerable scale, a pond three and a half feet deep was excavated on the premises of Messrs. George V. Shepard and H. H. Pierce, not far from Stockton, near the shore of Chincoteague Bay, and connected with the latter by a trench ten feet long, two feet wide, and three and a half feet deep. Before the water was let into the trench connecting the pond with the bay, a wooden diaphragm — made in the form of a box three feet deep, and two and a half feet wide, and two inches thick, and lined on the inside with gunny-cloth; the sides of the box being perforated with numerous auger-holes, and filled with clean sharp sand, so as to form a filter — was placed in the trench vertically and transversely, and so secured that no water, except such as had first filtered through the diaphragm, could gain access to the pond. In this way the natural fry from the bay was effectually excluded from our artificial enclosure from the very start, so that the results of our experiment might not be vitiated. In the construction of this simple apparatus we depended entirely upon the rise and fall of the tide to partially renew the water in the pond in the intervals between the tides. The tidal rise and fall of the water in the enclosure was from four to six inches, or from six to eight inches less than the rise and fall of the tide in the open bay. Into the enclosure, covering about fifty square yards, artificially fertilized spawn was poured at odd dates, from July 7 to the first week of August.

The spawn was taken from the adults much in the same way as from fishes; the right valve of the adult animals being removed, and the ducts of the reproductive organs stroked with a pipette to force out the eggs and milt from the females and males. The products mixed together in water were then allowed to stand in pails for a few hours, until the eggs had developed as far as the swimming stage. The spawn so prepared was then distributed over different parts of the pond, and left to take care of itself.

The collectors used were simply oyster-shells strung upon galvanized wire; strings of shells being suspended to stakes driven into the bottom of the pond at intervals corresponding to the dates when fresh lots of spawn were introduced, each stake being marked with the date when it was put in place. The suspended oyster-shells were introduced so as to afford the young fry clean surfaces to which it could attach itself. On the 22d of August Mr. Pierce found that some of the shells hanging to the stakes had spat attached, ranging from one-fourth to three-fourths of an inch in diameter, and which had undoubtedly been derived from some of the brood placed in the pond by us. Some specimens of these young oysters are now in my possession, attached to the perforated oyster-shells used as collectors.

To our great surprise, we found that the water in the pond maintained about the same specific gravity as that in the bay, or 1.0175 to 1.018, and that the temperature of the water was also the same as in the open bay. The microscopic vegetable food upon which the oyster feeds was found to multiply rapidly in the enclosure, inasmuch as it was confined by the gate or diaphragm, so that it could not escape. The water in the pond was also found to remain sweet, and free from putrefactive odors. It will accordingly be seen, that all the conditions of success had been established, as was fully proved by the result.

While it is too soon to affirm that artificial breeding may be profitably available on an extensive scale in practical oyster-culture, our experiment has demonstrated a number of very important facts. These are: 1. Oyster-spat may be reared from artificially fertilized eggs; 2. The spat will grow just as fast in such enclosures as in the open water; 3. Food is rapidly generated in such enclosures; 4. The density of the water in the ponds is not materially affected by rains, or leaching from the banks; 5. Ponds are readily excavated in salt-marsh lands, and can in all probability be used for fattening and growing Ostrea virginica for market just as successfully as Ostrea edulis and angulata are grown by a similar method on the coasts of France. Pond-culture, where there are salt-marshes adjoining arms of the sea the waters of which have a density below 1.020, can doubtless be carried on profitably in connection with the intelligent use of simple,