

# SCIENCE

NEW YORK, APRIL 15, 1892.

## A NEW PATENT OFFICE.

IN our issues of Jan. 29 and April 1, attention was called to the needs of the Patent Office and the great injustice which was persistently maintained against inventors, the public, the nation as a whole, and the official staff of the Patent Office by the criminal over-crowding of that office consequent upon the insufficient space assigned it in its own building, by the shameful absence of provision for ventilation, and, not least, by the introduction of the offices of the Interior Department into a building erected with the money of inventors taxed heavily for the privilege of giving a wealth and a prosperity to their country, far beyond anything seen elsewhere in the world.

We now observe that the daily papers report that on the 7th instant Senator Falkner introduced a bill, not to give the Patent Office the control of its own building and to appropriate the \$4,000,000 or so much as may be needed of it to the extension and improvement of that building, *but* to erect a new building. The cost is not to exceed \$3,500,000, and \$500,000 is appropriated to begin the work. In other words, this proposition—it may never be more—is to give to the Interior Department a building erected at a cost of \$3,000,000 by the inventors of the country, mostly poor men struggling against every misfortune, and *then* to take an additional \$3,500,000, also contributed by these needy inventors for the privilege of making their country and its already wealthy men still wealthier, and appropriating *that* to the construction of *another* building for the Patent Office. In other words still, it is proposed to take of the \$7,000,000 which we have, in the course of the century, forcibly wrenched from the almost empty purses of our thousands of talented but needy inventors as a tax upon them for enriching their country, one-half the whole for the construction of a building that it is a disgrace to the nation not to have given them long ago, and to give the other half to a Department which has absolutely no claim upon it, which has been an incubus upon the work of the Patent Office for years, and which is to-day through the exercise of technical legal power and in defiance of justice and public policy, a “squatter” on the territory of the Patent Office and a nuisance there. It seems remarkable that this should be possible, in the face of justice and in spite of the united power of all the inventors in the land, of all their representatives, and of all the members of the legal profession who are daily earning their fees by doing the business of these wronged inventors. The whole matter is a standing disgrace to the country and our representatives in Congress, and a crying injustice to the men who have built up the whole modern system of production of the United States.

The *Scientific American*, referring to proposed legislation by which it is provided that foreign inventors shall be taxed the same amount in this country as in their own for such protection, says:—

“The theory upon which we grant patents and the object of our patent laws is the promotion of useful arts and indus-

tries, not the taxation of inventors. The aim of our patent laws is to encourage the study and development of new inventions, whereby multiplied and diversified forms of novel industries are made accessible to the people; for by industries they thrive. The American law as it stands invites inventors throughout the world to bring hither their new inventions and set up their new industries. In reward for so doing it grants them a patent for seventeen years, after which the invention becomes free to the public. The larger the number of patents granted, the greater will be the number of new industries established, and our measure of prosperity will be correspondingly increased. As a people we have everything to gain and nothing to lose by encouraging inventors, no matter where they live or where they were born.”

It is in this, as we consider it, correct theory of the patent system that all our legislative action and every policy relative to patents should be determined. Make the patent-fees as small as is practicable; stimulate inventors to bring out their inventions; insure the most complete and perfect protection; and give the inventor at least the full worth of his money. It is scandalous and disgraceful to tax a poor man for the privilege of promoting the best interests of his country. Not one inventor in thousands acquires a competence; but the inventions of these very men make the nation and its capitalists rich. If the whole \$7,000,000 contributed by them to the Patent Office treasury is needed to insure this they should have it—and ten times more if good use can be made of it.

## OBSERVATIONS ON THE GROWTH AND CHEMICAL COMPOSITION OF THE MAIZE (CORN) PLANT.

JUNE 12, 1891, seventy-five hills were selected in a field of Leaming corn planted May 15. Each hill contained three corn plants, and they were as nearly uniform in appearance as could be found in the field. The seventy-five hills were divided into fifteen lots, each lot containing five hills. Beginning June 12, and every week thereafter during the season, the plants in four hills of corn in one plat were cut close to the ground. The plants from one of these hills were dried and preserved. A chemical analysis was made of the plants from each of the remaining three hills, so that during the growing season these analyses were made of triplicate samples taken each week. The fifth hill of corn in each lot was left to grow, and was measured each week during the season. Each corn plant in the seventy-five hills was measured every week until it was cut. These measurements included the height to the tip of the upstretched longest leaf and also to the tip of the tassel when it was present, making a total of 3,159 measurements.

The soil in which the corn was grown was very uniform prairie land, located in central Illinois. The season was below the average for corn-growing because of the drouth.

Like almost everything else that grows, the plants did not all make the same amount of growth in height each week. There was quite a variation in the growth of the different

stalks, the maximum height being reached about Aug. 1; but, as will be seen further on, the plants had acquired at that time less than one-half of their total dry matter.

A condensed summary of some of the observations made is given in the following table:—

Week Ending.	Number of Plants Measured.	Height of Plants (inches).		Field- Notes.	Dry Matter per Plant (grams).	Rain- fall (inches).	Average Daily Temperature, Fahr.			Percentage Composition of Dry Matter.				
		Ex- tremes	Aver- age.				Mean.	Maximum.	Minimum.	Ash.	Prctein.	Crude Fibre.	Nitrogen Free Extract.	Ether Fxtact.
June 12	2 5	11-26	16			.48	66	76	55					
19	225	23-43	31		4.5	.30	75	90	62	11.2	27.5	23.3	35.7	2 2
26	213	32-64	47		19.9	1.20	75	86	60	11.8	24.1	25.4	36.7	1.9
July 3	201	50-84	65		30.4	.03	72	85	58	11.5	19.1	28.1	39.4	1.9
10	189	57-91	73		50.0	.07	68	81	51	10.5	19.1	29.2	39.5	1.6
17	177	59-102	84		114.2	.47	72	86	57	8.9	15.7	30.6	42.8	1.8
24	165	64-111	96	Full tassel.	161.5	.20	73	86	60	7.9	12.1	29.1	49.2	1.6
31	153	81-115	98	Silks alone.	161.2	.67	68	80	54	7.1	11.3	28.1	51.0	2.4
Aug. 7	141	82-116	93	{ Pollen shed. Silks dead.	215.1	.01	71	87	55	6.0	10.8	26.7	54.6	1.8
14	129	82-118	98		200.0	1.35	74	94	62	6.8	10.8	29.5	51.2	1.5
21	117	82-118	97	Roasting ear stage.	256.0	1.28	75	86	67	6.2	10.3	27.5	53.9	2.0
28	105	82-115	97	Corn denting.	294.9	.13	62	74	50	5.7	9.3	24.7	57.5	2.6
Sept. 4	93	81-114	97	Husks turning brown.	349.5	.34	63	77	49	5.1	8.5	21.7	61.7	2.9
11	81	81-114	96		319.7	0	62	76	46	5.0	8.9	20.4	62.8	3.0
18	69	81-113	93	Husks dry. 50% leaves dead.	290.0	.0	73	90	57	5.2	9.7	19.7	62.5	2.8

The figures giving the grams of dry matter per plant and the composition of the dry matter represent an average per plant of the nine analyzed each week, or three hills of corn, each containing three plants. No attempt was made to separate the different parts for analysis, such as the ear, stalk, and leaves, but that part above ground was taken as one plant.

The rainfall during the season was considerably below the average, and is here given in inches:—

Average.	June.	July.	August.	September.
For ten years.	5.04	2.75	3.45	3.27
For 1891.	2.08	1.41	2.86	0.41

The record shows that the average maximum height per plant was attained during the week ending July 31; but it contained at that time only 46 per cent of the maximum quantity of dry matter.

The growth in dry matter continued till Sept. 4, and the decrease after that date probably was due to breaking off and blowing away of dry or dead portions of the leaves.

Assuming the total height per plant to be 100 inches and that it was 19 inches high June 12, or 19 per cent of its total height, also that the maximum growth in weight was 350 grams of dry matter, the percentage of the total height and weight attained each week is as follows:—

	June 12	19	26	July 3	10	17	24	31	Aug. 7	14	21	28	Sept. 4	
Height.	19	13	17	19	9	10	11	2 = 100 total.						
Weight of Dry Matter.		1.3	4.6	3.2	5.8	18.5	12	0	15.6	0	11.9	11.3	15.8	= 100 total.

The omission of two weeks in the record where no increase in dry matter was found is caused by the fact that we cannot have the plant and analyze it too.

During the week ending Aug. 14 the record shows that for this season an unusually large quantity of rain had fallen, and the plants which were analyzed that week showed a smaller quantity of dry matter than those of the week before.

The analyses of the dry matter show that 100 pounds of the corn plant has quite a different composition at the various stages of its growth. The percents of ash, or mineral matter, and also of protein are highest when the plant is young, and these decrease with age; while the nitrogen-free extract, or carbo-hydrates, increases in percentage as the plant matures.

Assuming that there are 10,000 corn plants per acre, which number it has been found is a fair estimate of the thickness of planting in Illinois, these analyses show that an acre of corn grown to maturity contains 7,716 pounds of dry matter, and this dry matter is composed of 394 pounds of ash, or mineral matter, 656 pounds of protein, and 6,666 pounds of carbo-hydrates.

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### THE TOMB OF KING AMENHOTEP.

THE tomb of King Amenhotep IV. has at last been brought to light in the nekropolis of Tel-el-Amarna in middle Egypt.

Since the close of the year 1890 the direction of explorations in Egypt has been occupied in clearing the two most

important groups of graves in the neighborhood of this site, which belonged to the eighteenth dynasty, and many tombs have already emerged from the heaps of *debris* under which