

coagulating power, a suspicion which is strengthened by the fact that the more there is available, as when it is supplied under pressure, the quicker is the effect. Some may look askance at so simple an explanation when so complicated a phenomenon is involved, and they are quite justified in doing so. This explanation is advanced not as final, but as a theory well worthy further examination by the experimental method, the method by which only can science be advanced, my purpose here being to discover a problem in science as it confronts the investigator rather than to lead you on the smooth, well-worn but less picturesque and romantic road in the domain of the already known. Let me, therefore, not tax your patience too far, enough, however, to allow me to reaffirm that the problems of science are not of mere academic interest; and that sooner or later they relate themselves to human life. The problem which has been outlined illustrates this principle, and it is one which I venture to assert is well worth the severe application of the investigator, entrenching as it does on that field of the physiology of the obscure processes of respiration, digestion, enzymatic action, the relations of crystalloids and colloids and the like—in short on that field where the physiology of living things, whether of animals or plants, overlaps the as yet undeveloped knowledge of collochemistry, a field surrounded by a wide horizon of the unknown, to pass which even with a stumbling tread requires a sure faith in the strength of the staff of scientific method.

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UNIVERSITY REGISTRATION STATISTICS

THE registration returns for November 1, 1912, of twenty-nine of the leading universities of the country will be found tabu-

lated on the following page. Specific attention should be called to the fact that these universities are neither the twenty-nine largest universities of the country in point of attendance nor necessarily the twenty-nine leading universities, nor is there any desire on the part of the compiler to insist upon a quantitative standard as the only proper basis for comparison of our institutions of higher learning. Five institutions exhibit a decrease in the total enrollment (including the summer session), namely, *Cornell*, *Illinois*, *Iowa*, *Johns Hopkins* and *Pennsylvania*, while four institutions showed a loss in the total enrollment last year, and three in 1910 and four in 1909. The largest gains in terms of student units, including the summer attendance, but making due allowance by deduction for the summer session students who returned for instruction in the fall, were registered by *Columbia* (1,069), *California* (733), *Minnesota* (515), *New York University* (488), *Texas* (475), *Nebraska* (391) and *Harvard* (303). Last year there were four institutions that showed a gain of over three hundred students, namely, *California*, *Columbia*, *Cornell* and *Ohio State*, whereas in 1911 and in 1910 there were seven institutions that registered such an increase. Omitting the summer session attendance, the largest gains have been made by *Indiana* (990), *Chicago* (700), *California* (690), *Columbia* (484), *New York University* (375), *Nebraska* (337), *Texas* (318), *Cornell* (284), *Northwestern* (232) and *Syracuse* (209). It will thus be seen that this year ten institutions exhibited an increase of over two hundred students in the fall attendance, as against four in 1911, seven in 1910 and eleven in 1909. It will be observed that of these institutions four are in the east, five in the west and one is in the south.

According to the figures for 1912, the

Faculties	California	Chicago	Columbia	Cornell	Harvard	Illinois	Indiana	Iowa	Johns Hopkins	Kansas	Michigan	Minnesota	Missouri	New York	Northwestern	Ohio State	Pennsylvania	Pittsburgh	Princeton	Stanford	Syracuse	Texas	Tulane	Virginia	Washington Univ.	Western Re-	Wisconsin	Yale
College, Men.....	914	879	819	1051	2306	454	1415	529	197	612	1550	633	774	413	452	423	384	400	1409	545	1313	773	152	368	162	456	749	1326
College, Women.....	1425	720	590	1185	483	348	925	494	...	540	732	908	480	182	563	380	...	...	...	442	37	634	249	...	217	354	727	...
Agriculture.....	429	...	...	...	...	...	...	...	...	...	...	396	454	...	...	720	...	...	...	...	55	55	15	...	44	...	802	...
Architecture.....	116	129	129	133	341	...	...	...	...	24	...	...	...	...	...	41	215	...	...	...	175	...	68	...	...	...	...	42
Art.....	...	...	...	...	...	...	85	...	...	...	...	...	...	...	...	...	636	...	...	...	...	...	...	...	...	...	...	...
Commerce.....	297	...	...	...	107	206	...	...	...	...	...	...	...	1898	450	...	...	...	...	...	...	...	...	...	...	...	317	...
Dentistry.....	89	...	...	...	192	...	...	176	...	...	252	239	...	...	478	...	508	176	...	...	...	...	52	101	127	...	100	...
Divinity.....	132	...	...	...	48	...	...	...	...	...	...	...	...	...	222	74	...	...	...	...	177	...	...	...	...	...	...	40
Forestry.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Graduate School (non-professional).....	382	490	1399	296	532	256	151	131	207	84	206	63	112	315	80	107	403	40	148	94	75	55	17	40	53	14	268	429
Journalism.....	...	...	...	...	...	...	70	...	...	...	...	...	55	...	...	...	...	...	...	...	...	...	...	...	...	...	95	...
Law.....	159	177	457	294	740	122	105	218	...	184	654	237	121	693	368	194	385	143	...	136	240	318	87	226	76	130	160	132
Medicine.....	108	127	336	120	288	...	142	113	351	79	298	180	56	408	258	...	313	136	...	46	86	150	349	90	68	168	65	45
Music.....	...	...	...	...	...	79	118	...	...	118	...	...	...	...	452	...	30	...	...	...	855	...	91	...	...	60	92	...
Pedagogy.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	478	...	...	...	398	97	...	...	...	54	...
Pharmacy.....	87	...	...	...	...	176	...	...	...	72	92	77	...	...	193	85	...	195	...	...	...	61	12	...	111	15	...	...
Scientific Schools*.....	735	...	634	1419	132	965	...	168	...	380	1284	591	344	190	57	726	713	235	161	398	305	289	132	99	159	...	728	1139
Veterinary Medicine.....	...	...	...	...	...	...	...	...	...	...	...	...	...	16	...	155	115	...	...	...	...	...	...	...	...	...	...	...
Other courses.....	...	740	...	...	...	269	...	...	17	...	...	12	...	...	178	252	808	102	...	...	151	32	10	...	78	50	5	...
Deduct double registration.....	156	165	334	13	...	...	...	63	...	219	145	...	189	107	192	12	220	72	150	...	97	553	93	24	...	88	80	...
Total, November 1, 1912.....	4741	3366	6153	4805	4828	3948	2340	1766	772	2112	4923	3418	2388	4063	3619	3274	4290	1833	1568	1661	3392	2253	1238	799	958	1378	3957	3265
Summer Session, 1912.....	2275	3531	3602	1307	1046	640	1197	324	201	469	1324	494	691	645	78	600	751	...	...	50	257	927	1116	†	...	1741	...	...
Deduct double registration.....	403	546	748	500	145	273	280	146	29	178	627	319	208	165	65	266	198	...	...	41	120	164	105	...	...	...	557	...
Grand Total Nov. 1, 1912.....	6457	6351	9007	5412	5729	4315	2234	1944	1087	2403	5620	5063	2871	4543	3632	3608	4843	1833	1568	1670	3529	3016	2249	799	958	1378	5141	3265
Grand Total Nov. 1, 1911.....	5724	6062	7938	5609	5426	4929	2154	1967	1238	2265	5452	4548	2780	4055	3438	3567	5220	...	1543	1648	3307	2539	2040	781	859	1331	5015	3224
Grand Total Nov. 1, 1910.....	4552	5883	5883	5169	5329	4659	2102	1957	890	2246	5339	4972	2678	3947	3543	3181	5187	...	1451	1648	3248	2597	1985	688	796	1274	4745	3287
Grand Total Nov. 1, 1909.....	3968	5487	5487	5028	5558	4502	2221	2246	792	2141	5258	4351	2589	3843	3197	3012	4857	...	1398	1620	3248	...	1882	767	811	1083	4245	3276
Grand Total Nov. 1, 1908.....	3644	5114	5114	4700	5342	4400	2113	2356	707	2086	5188	4607	2558	3951	3113	2700	4555	...	1314	1541	3204	...	1171	757	806	1016	3876	3466
Grand Total Nov. 1, 1903.....	3477	4146	4146	3438	6013	3239	1086	1260	694	1319	3926	3550	1540	2177	2740	1688	2644	...	1434	1370	2207	...	1037	613	761	765	3321	2990
Extension and similar courses.....	894	3031	2959	...	21	1000	114	207	114	367	...	1326	305	700	...	273	...	451	...	...	...	330	152	...	207	Inc.	10,644	...
Officers.....	486	337	867	825	771	577	93	236	206	178	472	442	277	381	437	274	549	271	223	278	265	226	313	100	184	212	595	431

* Includes schools of mines, engineering, chemistry, and related subjects.

† Included elsewhere.

‡ 1285 students in attendance on summer courses (see note in body of article).

twenty-nine institutions, inclusive of the summer session, rank as follows: *Columbia* (9,007), *California* (6,457), *Chicago* (6,351), *Harvard* (5,729), *Michigan* (5,620), *Cornell* (5,412), *Wisconsin* (5,141), *Minnesota* (5,063), *Pennsylvania* (4,843), *New York University* (4,543), *Illinois* (4,315), *Northwestern* (3,632), *Ohio State* (3,608), *Syracuse* (3,529), *Yale* (3,265), *Texas* (3,016), *Missouri* (2,871), *Nebraska* (2,811), *Kansas* (2,403), *Tulane* (2,249), *Indiana* (2,234), *Iowa* (1,944), *Pittsburgh* (1,833), *Stanford* (1,670), *Princeton* (1,568), *Western Reserve* (1,378), *Johns Hopkins* (1,087), *Washington University* (958), *Virginia* (799), whereas last year the order was *Columbia*, *California*, *Cornell*, *Michigan*, *Harvard*, *Chicago*, *Pennsylvania*, *Wisconsin*, *Illinois*, *Minnesota*, *New York*, *Ohio State*, *Northwestern*, *Syracuse*, *Yale*, *Nebraska*, *Missouri*, *Texas*, *Kansas*, *Indiana*, *Tulane*, *Iowa*, *Stanford*, *Princeton*, *Western Reserve*, *Johns Hopkins*, *Virginia*. If the summer session enrollment be omitted, the universities in the table rank in size as follows: *Columbia* (6,153), *Michigan* (4,923), *Harvard* (4,828), *California* (4,741), *Cornell* (4,605), *Pennsylvania* (4,290), *New York University* (4,063), *Wisconsin* (3,957), *Illinois* (3,948), *Northwestern* (3,619), *Minnesota* (3,418), *Syracuse* (3,392), *Chicago* (3,366), *Ohio State* (3,274), *Yale* (3,265), *Nebraska* (2,483), *Missouri* (2,388), *Indiana* (2,340), *Texas* (2,253), *Kansas* (2,112), *Pittsburgh* (1,833), *Iowa* (1,766), *Stanford* (1,661), *Princeton* (1,568), *Western Reserve* (1,378), *Tulane* (1,238), *Washington University* (958), *Virginia* (799), *Johns Hopkins* (772), whereas last year the order was *Columbia*, *Cornell*, *Michigan*, *Harvard*, *Pennsylvania*, *Illinois*, *Minnesota*, *California*, *Wisconsin*, *New York*, *Northwestern*, *Yale*, *Syracuse*, *Ohio State*, *Chicago*, *Nebraska*, *Missouri*,

Kansas, *Tulane*, *Iowa*, *Stanford*, *Princeton*, *Indiana*, *Western Reserve*, *Tulane*, *Virginia*, *Johns Hopkins*.

Owing to the fact that no statistics were given last year for the individual faculties, it is impossible to compare the gains or losses, as was done for 1910 and previous years, but attention will be called to important changes in connection with the discussion of the individual institutions. So far as the individual faculties of the various universities are concerned, *Harvard* with 2,306 men and 483 women (*Radcliffe College*) leads in the number of college undergraduates, being followed by *Indiana*, with 1,415 men and 925 women; *California*, with 914 men and 1,425 women; *Michigan*, with 1,550 men and 732 women; *Chicago*, with 879 men and 720 women; *Nebraska* with 645 men and 897 women; *Minnesota*, with 633 men and 908 women; *Wisconsin*, with 749 men and 727 women; *Columbia*, with 819 men and 590 women; *Princeton*, with 1,409 men, and *Texas*, with 773 men and 634 women.

In agriculture *Cornell* leads with 1,185 students, being followed by *Wisconsin* with 802, *Illinois* with 732, and *Ohio State* with 720. In architecture *Illinois* with 341 is followed by *Pennsylvania* with 215, *Cornell* with 133 and *Columbia* with 129. *Syracuse*, with 175 art students, leads in that field; while *New York University* continues to lead in commerce with 1,598 students; being followed by *Pennsylvania* with 636, *Northwestern* with 450 and *Wisconsin* with 317. The largest dental school is at *Pennsylvania*, where 508 students are enrolled, as compared with 478 at *Northwestern*, 252 at *Michigan* and 239 at *Minnesota*. *Northwestern* has the largest divinity school, enrolling 222 students, as against 132 at *Chicago*, 100 at *Yale* and 48 at *Harvard*; these are the only universities in the list that maintain schools of theology.

Syracuse has 177 students of forestry, *Ohio State* 74, *Nebraska* 64 and *Yale* 40; at *California*, *Harvard*, *Illinois*, *Michigan* and *Minnesota* the forestry students are counted in with other departments. *Columbia* has a long lead in the number of non-professional graduate students, there being no less than 1,399 students enrolled in its faculties of political science, philosophy and pure science. *Columbia* is followed by *Harvard* with 532 students, *Chicago* with 490, *Yale* with 429 and *Pennsylvania* with 403. *Wisconsin* has the largest school of journalism, enrolling 95 students as compared with *Columbia's* 72, *Indiana's* 70 and *Missouri's* 55. The largest law school is at *Harvard University*, where 740 students are registered in this subject; *New York University* follows with 693 students, *Michigan* with 654 and *Columbia* with 457. In medicine *New York University* leads with 408, being followed by *Johns Hopkins* with 351, *Tulane* with 349, *Columbia* with 336 and *Pennsylvania* with 313. *Syracuse* has the largest number of music students, namely, 855, there being 452 at *Northwestern* and 118 at *Indiana* and at *Kansas*. The Teachers College of *Columbia University* is by far the largest school of education connected with any of the institutions in the list. It has an enrollment this fall of no less than 1,606 students, as against 540 students of education at *Indiana*, 478 at *Pittsburgh*, 398 at *Texas* and 355 at *New York University*. *Columbia* also has by far the largest school of pharmacy, enrolling 420 students, as against 195 at *Pittsburgh*, 193 at *Northwestern* and 176 at *Illinois*. As for the scientific schools, *Cornell* continues to maintain its lead in this branch, enrolling 1,419 students, as against *Michigan's* 1,284, *Yale's* 1,139, *Illinois's* 965, *California's* 735, *Wisconsin's* 728, *Ohio State's* 726, *Pennsylvania's* 713 and *Columbia's*

634. In veterinary medicine *Ohio State* leads with 155, being followed by *Cornell* with 120 and *Pennsylvania* with 115. All of the above figures for individual faculties are exclusive of the summer session attendance. The largest summer session in 1912 was at *Columbia University*, where 3,602 students were enrolled, as against 3,531 at *Chicago*, 2,275 at *California*, 1,741 at *Wisconsin*, 1,324 at *Michigan*, 1,307 at *Cornell*, 1,197 at *Indiana*, 1,116 at *Tulane* and 1,046 at *Harvard*.

The largest number of officers is found at *Columbia*, where the staff of teaching and administrative officers consists of 867 members, as against 825 at *Cornell*, 771 at *Harvard*, 595 at *Wisconsin*, 577 at *Illinois*, and 549 at *Pennsylvania*.

California.—The 894 students listed under extension and similar courses were divided as follows: San Francisco Institute of Art, 225; Wilmerding School of Industrial Arts, 190; University Farm School, 150; Short Course in Agriculture, 187; Correspondence Courses in Agriculture, 142. In addition there is an enrollment of approximately 37,000 students in the farmers' institutes, etc. Of the 159 law students, 62 are graduate students in the department of jurisprudence, candidates for the degree of J.D., and 97 are registered in the Hastings College of Law as candidates for the degree of LL.B. Of the medical students, 82 are enrolled in the first and second years at Berkeley, and 19 in the third and fourth years at San Francisco, and 17 in the third and fourth years at Los Angeles.

Columbia.—97 college students are also registered in the professional faculties of the university (in the exercise of a professional option) as follows: 45 seniors in law, 26 seniors and juniors in medicine, 9 seniors in mines, engineering and chemistry, 5

seniors and juniors in fine arts, 6 seniors and juniors in journalism, and 6 seniors in Teachers College. Of the students in education, 1,379 were enrolled in Teachers College and 227 in the school of practical arts.

Cornell.—No information was given as to the number of summer session students who returned for work in the fall, and an estimate was therefore made based on the returns in the previous year.

Harvard.—The 483 students mentioned under "College, Women" are registered at Radcliffe College, where 80 of the 532 graduate students are also to be found.

Illinois.—The decrease in the total registration this year is caused by the discontinuation of the work in medicine and dentistry on June 30, 1912. The 269 students listed under "other courses" consist of 33 students in the library school, and 236 women enrolled in the courses in household science. The latter students are registered in three colleges, namely, arts, science and agriculture, but are not included in separate figures for these schools.

Indiana.—The large increase is due to the establishment of courses in journalism, music and pedagogy, which were not represented in the table of 1910.

Iowa.—Of the 113 students in medicine, 14 are taking work in homeopathic medicine. The students listed under "extension and similar courses" are students in pharmacy, medicine, the nurses' training school of the college of medicine, and that of the college of homeopathic medicine, in which schools high school graduation is not required for admission. The falling off in the grand total is due to the fact that these students were included in the upper part of the table in previous years. Music is now a part of the new college of fine arts, for the regular courses in which high school graduation is required, but since music students are not required to submit any en-

trance credentials, it is difficult to tell how many of the fine arts students have met secondary requirements for a collegiate course.

Minnesota.—The decrease in numbers in the college of science, literature and the arts is undoubtedly due to the qualitative requirement for admission. The apparent decrease in law is explained by the change in classification. Under the new administration, the evening law school has been abolished, and that work is now offered through the extension division. The decrease in students electing art is due to the shifting of that department from the college of science, literature and the arts to the college of education. The registration of the graduate school will doubtless equal last year's figure before the close of the present year. The falling off in pedagogy is the result of a change in classification; a number, heretofore registered as specials in that college, are now regular students in the college of science, literature and the arts.

Missouri.—The decrease in the enrollment in the schools of law, journalism and engineering is due to the fact that the standards of admission of these schools have been increased by the requirement of two years of college work in addition to a four-years' high school course. This requirement was first imposed in the session of 1911-12, but in that session the second and third classes in the school of law, and the sophomore, junior and senior classes in the schools of engineering and journalism consisted of students who had entered under the old standards of admission. The elimination of one of these classes explains the decrease in enrollment in these schools during the past session. The decrease will probably be manifested during the next session in the school of law and during the next two sessions in the schools of engineering and journalism. The schools of education and medicine also require two years of

college work for admission, but as this standard was established at an earlier date, all of the students who entered under the lower requirements have been eliminated and the enrollment in these schools is now beginning to increase.

New York University.—The school of commerce shows an increase of 226 over the total enrollment for last year. The requirements in this school are the same as they were last year and the increased attendance shows the demand for such courses. The medical college shows a decrease of 179 from the total enrollment of last year. The loss falls almost entirely upon the freshman class, which numbers 53 this year, as against 206 for November, 1911. The reason for this decrease in the entering class is that beginning with this year, one year of college work has been required for admission in addition to high school graduation. A one year preparatory course covering physics, chemistry, biology and scientific German is being offered for men who expect to enter the medical college next year, and there are at present 52 in this class whose names are included in the total for the collegiate division. The law school shows a small falling off of 16 from last year, which is doubtless due to the fact that in the autumn of 1911 the law school was placed on a strictly three-year basis for the degree.

Northwestern.—There is an increase in every school of the university excepting the medical school, but the most gratifying increase is in the college of liberal arts. A committee of alumni and officers started a campaign last year to interest the graduates in increasing the number of men. The campaign resulted in an increase in men in the freshman class over the previous class of fifty-two per cent.

Ohio State.—The total enrollment, including the summer session, shows but a

slight increase, which is due to the fact that the summer school of 1912 showed a decrease of 166 in its enrollment. This was largely due to the fact that the appropriation for the summer school was cut by the legislature from ten thousand to five thousand dollars, and it was necessary that certain courses be eliminated. All secondary work was dropped, and all students were of college or graduate rank and were required to meet the entrance requirements of the college in which they wished to enroll.

Pennsylvania.—While the total enrollment has fallen off as compared with the figures of the preceding year, there is an increase of 82 in the number of first year men. The increase of 4 in the first-year enrollment of the medical school indicates that the heavy falling off in registration due to the gradual raising of entrance requirements since 1908 has been checked, and a healthy reaction should be noticed from now on. The apparent falling off in total enrollment in the veterinary medical school is partly explained by the fact that the graduating class last June, 58, was unusually large. The normal senior class is about forty. The decrease in enrollment in civil, mechanical and electrical engineering is not peculiar to the university this year, as it is reported that there has been a falling off in those courses generally throughout the country.

Princeton.—Of the 1,409 undergraduates, 150 are students in the undergraduate civil engineering department, while the 11 additional students listed under scientific courses are enrolled in the electrical engineering school.

Texas.—In the fall of 1908 the minimum number of entrance units on which a student might be admitted was increased from eight units to eleven units, and the following year from eleven units to twelve units, at which number it has continued until the

present time. Beginning with the fall of 1909, five college courses were required for admission to the department of law, and since the fall of 1910, five courses have been required for admission to the department of medicine. The percentage of men over women registered in the college of arts this session is larger than ever before. This is doubtless explained by the fact that more men than heretofore are taking their pre-medical and pre-law training.

Tulane.—Fourteen of the students listed under medicine are enrolled in the post-graduate medical school. The 10 students listed under "other courses" are taking work in household economy. Inasmuch as no allowance was made in the table furnished for the summer session students who returned for work in the fall, an estimate was made based on the previous year.

Virginia.—1,285 of the students were in attendance on the summer school of 1912, which is not a part of the university session.

Washington University.—The 78 students listed under "other courses" are enrolled in the school of social economy. In addition to the students accounted for in the table, there are 140 registered in the school of fine arts, but these have been omitted because the school does not require a four-year high school course for admission. They have been included, however, under "extension and similar courses." Many of these students have a high school training and a number have even more. In two departments the university has steadily advanced the requirements, and the changes in these departments have lowered the registration and of course affected the attendance materially. In the law school the changes began in 1901-02. In this year a full four-year high school requirement for admission was enforced. In 1904-1905 the course was extended to a full three-year course, and the tuition was

raised from eighty to one hundred dollars. In 1909-10 the department was removed from a location well down in the city to the new campus, and in 1910-11 a full year of college work was required for admission in addition to a four-year high school course. As a result of these changes, the registration has decreased from 124 in 1900-01 to 76 on November 1, 1912. The entering classes are showing a recovery from the increased requirement, and the total registration this year of entering students was 29 regulars and 9 unclassified, as against 17 regulars and 8 unclassified when the last change in the requirement of a full year of college work went into effect. More marked still has been the change in the medical school. Here a complete reorganization has been effected, vastly adding to the facilities and to the teaching staff, placing the instructors on a full time basis even in the clinical departments for the burden of the teaching and research, but retaining a considerable number of men on part time to supplement the work of the regular staff in instruction and in the clinics. In 1910-1911 the requirement for admission was advanced to a full year of college work in addition to a four-year high school course; the college requirement involving specific prescriptions in chemistry, biology, physics, German and English. The number received under this new requirement dropped to 13 from 50 the preceding year. Furthermore, the requirements for advanced standing were increased and rigidly enforced. The following year the entering class showed a recovery, the number rising to 23; but in 1912-13 (the current session), the requirement of two years of college work in addition to a full four-year high school requirement for admission, went into effect. This college requirement included specific prescriptions of two years of chemistry, one of biology, one of physics, two of German,

one of English, and electives, and the requirements for admission to advanced standing were further advanced. Again, the tuition fee was raised to one hundred and fifty dollars from a fee ranging from one hundred to one hundred and forty dollars. This increased tuition fee affected all entering students either for the first year class or for advanced standing. Under this new requirement the registration for the entering class dropped to 5 and the number received to advanced standing dropped to 8, although 69 applied for advanced standing and a very great number for admission to the first-year class. As a result of the changes in the medical school, the registration dropped in three years from 185 to 68, and the number will probably decrease next year, as the last of the larger entering classes on the old basis will pass out. The registration of the college, where the admission requirements have remained the same, shows a fair increase.

Western Reserve.—In 1911-12 the law school became, as the medical school has been for some years past, a graduate school.

Wisconsin.—Of the 802 students in agriculture, 50 are graduate students, and of the 728 in the engineering school, 20 are graduate students. The figures for pharmacy are inclusive of 26 students enrolled in the two-year pharmacy course, which does not require four years of high school preparation. The 5 students listed under "other courses" are enrolled in the Wisconsin library school, and are also counted in letters and science. In addition there are 31 students enrolled in the library course, which does not require four years of high school preparation. The figures are also inclusive of the students enrolled in the short courses in agriculture and in dairying. Last year there were 424 in the former and 133 in the latter.

Yale.—The decrease in the enrollment in

the law and medical departments is due to the continued application of the recently increased requirements for admittance to these departments. The present general requirement for admission to the Yale law school is a bachelor's degree from a college of approved standing. The general requirement for admission to the medical school is a college degree or evidence of completion of at least two years of regular college work. The registration in the first year classes of the law school and medical school is greater than the final registration in the first-year classes of these schools for last year.

RUDOLF TOMBO, JR.

THE FUR SEAL CENSUS

EVER since the fur seal herd of the Pribilof Islands came into the possession of the United States, through the purchase of Alaska, in 1867, one of the most important practical problems in connection with its management has been the making of some sort of enumeration or estimate of its numbers. The first attempt was made in 1869 by Captain Charles Bryant, first agent in charge of the herd. He estimated that the animals occupied 18 miles of shoreline to an average depth of 15 rods, 20 seals to the square rod, giving a total of 3,265,000 breeding seals and young. He did not estimate the number of non-breeding seals, animals of three years or under of both sexes.

A second attempt was made in 1872-74 by Mr. Henry W. Elliott, a special agent of the Treasury Department. He followed the same method of gross estimate, refining somewhat upon Captain Bryant's work, as it were, reducing to feet and inches what his predecessor had expressed roughly in miles and rods. His breeding area differed radically from that of Captain Bryant—6,386,000 square feet instead of 23,500,000. He, however, assigned only 2 square feet to each individual animal, whereas Captain Bryant gave 14 square feet. These over- and underestimates practically balance each other and leave