

The view here advanced, it is thought, presents far less difficulty. It is indeed an extension of Mallet's idea to include other factors of energy besides pressure.

The fact that the heated volcanic masses are in the earth, surrounded by materials of low heat-conducting power, makes the accumulation or retention of heat energy generated by mechanical work possible. The local character, as well as the varied nature of volcanic phenomena, is not difficult to understand. Volcanic outbursts must continue so long as readjustments of the positions of rock masses under a critical condition of pressure occur with the deeper surface layers.

If, as appears probable, the earth's interior is metallic iron, surmounted by a covering of oxidized lighter material, slag-like in character but altered by water and sedimentation, etc., the interior temperature or that of the metallic body is not likely to be very high, and it must be fairly uniform in spite of the gradual increase noted in the surface rocks at increasing depths. Such surface rocks or layers, being of relatively low heat conductivity, serve, so to speak, as a non-conducting blanket in which alone a considerable temperature gradient would be manifested. This condition does not forbid the possibility of the readjustments of masses herein regarded as the initial cause of superheating, even if those masses be quite hot but under such gravitational pressure of superincumbent masses as to forbid fusion.

ELIHU THOMSON.

THE GEOGRAPHICAL DISTRIBUTION OF THE
STUDENT BODY AT A NUMBER OF
EASTERN AND WESTERN UNI-
VERSITIES AND EASTERN
COLLEGES.

THE accompanying table explains the geographical distribution of the student body of six of the leading universities of

the east and of four western institutions, as well as of three New England and two Pennsylvania colleges for the academic year 1905-06, summer session students being in every instance omitted. It was impossible to secure accurate figures for the academic year just closed in the case of the *University of California*, and consequently the figures for 1904-05 were substituted. Comparing the attendance by divisions of the six eastern universities (*Columbia*, *Cornell*, *Harvard*, *Pennsylvania*, *Princeton*, *Yale*) with the corresponding figures for the same universities included in a similar table published in SCIENCE, N. S. Vol. XXII., No. 562 (October 6, 1905), pp. 425-6, we note in the first place that there has been a gain for these universities taken as a whole in every division, the largest increase in actual number of students, leaving the north Atlantic division—in which all of these six universities are located—out of consideration, having been recorded in foreign countries, where there has been a gain of eighty-seven students, this being as large as the entire increase of the student clientele of these universities in the United States divisions (exclusive of the north Atlantic). In the south Atlantic states and in the insular possessions these eastern universities have made only a slight gain; in the south central division all of them show an increase with the exception of *Princeton*; in the north central division the chief gains have been made by *Columbia*, *Princeton* and *Yale*, in the western division by *Columbia*, *Pennsylvania* and *Yale*, and in foreign countries by *Columbia*, *Cornell* and *Harvard*. These figures bear out the statement made by the writer in earlier contributions to SCIENCE to the effect that the western and southern clientele of the prominent eastern universities is not suffering any shrinkage. At *Columbia* the attendance from outside

RESIDENCES OF STUDENTS
(A) UNITED STATES

1905-1906	Amherst	California	Columbia	Cornell	Dartmouth	Harvard	Illinois	Lafayette	Lehigh	Michigan	Pennsylvania	Princeton	Williams	Wisconsin	Yale
North Atlantic Division.	387	9	3486	2517	879	3494	26	324	509	490	2517	955	348	39	2239
Connecticut	24		73	46	22	58		2	5	5	38	15	17		1057
Maine	3		20	13	44	116	1			9	11	3	6		28
Massachusetts	196	4	78	78	418	2383	5	1	11	18	60	24	95	5	188
New Hampshire	1		7	7	243	70			1	5	14	2	4	2	12
New Jersey	12	2	407	143	8	68	1	65	52	13	207	272	29	5	112
New York	110	3	2774	1911	54	501	12	23	47	248	130	277	173	14	608
Pennsylvania	24		95	301	6	169	6	233	392	175	2046	357	14	11	188
Rhode Island	8		11	10	6	99			1	5	7	2	1	1	25
Vermont	9		21	8	78	30	1		12	4	3	9	1	1	21
South Atlantic Division.	11	3	112	180	7	110	16	11	99	40	152	95	3	15	98
Delaware			1	9		1		3	3		32	5			13
District of Columbia	4	2	6	53	5	38	3	5	19	12	22	17	2	6	27
Florida	1		6	2		4	2			4	7	3			7
Georgia			22	12		9	3			5	8	3		3	7
Maryland	5	1	16	47	1	18	1	3	60	2	38	45	1	3	10
North Carolina			19	11		8	3		1	3	8	6		1	9
South Carolina	1		15	7	1	11	2		1	1	5	3		1	9
Virginia			20	30		13	2		10	8	16	8			10
West Virginia			7	9		8			5	5	16	5		1	6
South Central Division.	5	3	75	80	3	92	47		15	63	64	63	2	8	89
Alabama	1		14	16		9	1		1	3	13	6			7
Arkansas			5	7		8	5			7	4	4		3	1
Indian Territory			1	2			3			2	2	2			1
Kentucky	2		17	13	1	36	7		4	24	25	23	1		30
Louisiana			6	5		11	6			1	2	1			6
Mississippi		1	7	7		2	6		1	1	3	5			4
Oklahoma			1	1		6	2			10	1			1	4
Tennessee	1		10	12	1	9	4		9	3	2	9		2	14
Texas	1	2	14	17	1	11	13			12	14	13	1	1	22
North Central Division.	43	37	287	380	91	487	3299	9	6	3380	139	219	86	3120	536
Illinois	10	8	28	121	54	106	2872	4	1	313	16	59	31	193	147
Indiana	1	1	40	28	1	39	75			163	13	24	8	24	26
Iowa	2	9	10	20	3	42	93	1		88	13	20	6	71	34
Kansas		3	13	7	1	15	21		1	34	8	4	1		18
Michigan	5	4	33	22	2	28	31	1	2	2275	8	13	3	11	37
Minnesota		2	27	9	1	30	24	2		26	9	10	8	30	45
Missouri	16	3	32	24	8	42	34			67	8	22	1	16	58
Nebraska	1	1	13	6	3	13	18			18	1	4	2	4	7
North Dakota		1	3	1		4	4			9	1			9	
Ohio	6	2	63	128	14	137	31	1	2	341	54	45	18	16	135
South Dakota		1	3	1	2	2	15			11	2	2		15	5
Wisconsin	2	2	22	13	2	29	81			35	6	16	8	2731	24
Western Division.	7	3202	117	75	15	124	47	2	1	149	37	31	5	25	93
Arizona		3	4			1	2			3				1	1
California	1	3093	30	18	1	45	5			25	7	6	1	4	21
Colorado	3	7	19	19	12	28	13			41	8	10	1	11	33
Idaho		2	2	3		2	4			4	3				1
Montana		5	14	4		9	6			25	1	6		3	3
Nevada		5	3			1									1
New Mexico		7	1		1	4	1			7	1			2	
Oregon	1	35	9	11		11	5	1	1	7	2	4	1	3	13
Utah		7	25	10		11	4	1		16	3	3			7
Washington	2	38	8	8	1	11	7			14	12	1	1	1	11
Wyoming			2	2		1				7		1	1	1	2
Insular Possessions.		14	6	23		12	12	1	4	11	5	1	1	9	8
Hawaiian Islands		9	3	5		9	1			1	1		1		6
Philippine Islands		5		12		10	1	1		5	2			8	1
Puerto Rico			3	6		3	1		4	5	2	1		1	1
Total.	453	3268	4083	3255	995	4319	3447	347	634	4133	2914	1334	445	3216	3063

the north Atlantic division has increased from 15.07 per cent. to 17.65 per cent. during the last four years.

Taking the UNIVERSITIES in the accompanying table by divisions, we find that *Harvard* and *Columbia* have the largest representations in the north Atlantic division, *Cornell* and *Pennsylvania*, *Yale* and *Princeton* following in the order named. *Michigan's* representation has increased from 394 to 490 in one year, the other western (the term as thus used includes the north central and western divisions) universities—*California*, *Illinois*, *Wisconsin*—attracting only a few students from this section of the country. *Harvard* leads in all of the New England states with the exception of Connecticut, where *Yale* of course has the largest clientele. *Columbia* and *Cornell* naturally have the largest representation in New York state, *Yale*, *Harvard*, *Princeton* and *Michigan* following in the order named, as they did last year. *Michigan's* increase in this state—from 195 to 248—is noteworthy. In *New Jersey* the order is also identical with that of last year, namely, *Columbia*, *Princeton*, *Pennsylvania*, *Cornell*, *Yale*, *Harvard*. The *University of Pennsylvania* naturally leads in its own state, followed by *Princeton*, *Cornell*, *Yale*, *Harvard*, *Columbia*. Examining the attendance at the COLLEGES from these states, we note that the order for the entire division is *Dartmouth*, *Lehigh*, *Amherst*, *Williams*, *Lafayette*. *Dartmouth* leads the colleges in Maine and Massachusetts—*Harvard* being the only one of the universities having a larger following in these states than the New England college in question—as it does in New Hampshire and Vermont, where its following is far in excess of that of any other college or university represented in the table. Only a few students from Rhode Island attend the colleges included in the

table, the students from this state being attracted in largest number to *Brown* and *Harvard*. In Connecticut the order is *Amherst*, *Dartmouth*, *Williams*, all of the eastern universities except *Princeton* having a larger representation in this state than any of the New England colleges here included. *Lafayette* and *Lehigh* have no following to speak of in any of the New England states, although they are well represented in New Jersey and New York. In the states just mentioned the order of the New England colleges is *Williams*, *Amherst*, *Dartmouth*, all three exceeding the two Pennsylvania colleges in New York and being surpassed by them in New Jersey. Of the eastern universities *Pennsylvania* has the largest percentage of enrolment from its own state, namely, 67 per cent.; of *Columbia's* student body 66 per cent. come from New York state, of *Cornell's* 56 per cent. hail from the same state, of *Harvard's* 54 per cent. are residents of Massachusetts, of *Yale's* 33 per cent. have their permanent residence in Connecticut, and finally, of *Princeton's* students only 20 per cent. are residents of the state of New Jersey. *Princeton* and *Yale* are thus the only two of the eastern universities mentioned which attract more than half of their students from outside the states in which they are respectively located. Of the three New England colleges here included, 21 per cent. of the student enrolment of *Williams* hail from Massachusetts, 24 per cent. of *Dartmouth's* student body come from New Hampshire (32 per cent. from New Hampshire and Vermont), and 43 per cent. of *Amherst's* students have their permanent home in Massachusetts. All of these colleges therefore attract the larger percentage of their student body from outside of the states in which they are respectively located, while in the case of *Lafayette* and *Lehigh* the reverse is true,

the percentage of Pennsylvania residents being 67 per cent. in the case of *Lafayette* and 60 per cent. in the case of *Lehigh*. It is also interesting to observe that *Dartmouth* draws more students from Massachusetts than it does from New Hampshire, that *Princeton* draws more students from Pennsylvania than from New Jersey, and that *Williams* attracts more from New York than from Massachusetts.

Coming next to the south Atlantic division, we see that the students from this section are attracted to the six eastern universities in the same order as last year, namely, *Cornell*, *Pennsylvania*, *Columbia*, *Harvard*, *Yale*, *Princeton*. *Michigan* is the only one of the three western universities here included that makes any showing in this division, being exceeded by all of the eastern universities, while of the colleges *Lehigh* is the only one that is at all well represented, the south Atlantic following of this institution being in excess even of that of *Princeton*. As far as the individual states are concerned, *Pennsylvania* leads in Delaware, *Cornell* in the District of Columbia and in Virginia, *Pennsylvania* and *Yale* in Florida, *Columbia* in Georgia, North Carolina and South Carolina, *Lehigh* in Maryland, and *Pennsylvania* in West Virginia.

In the south central division *Harvard* heads the list (92 as against 80 last year), with *Yale* (89-80), *Cornell* (80-76), *Columbia* (75-72), *Pennsylvania* (64-44), *Michigan* (63-64), *Princeton* (63-72), *Illinois* (47-47) and *Lehigh* following in the order given, the representation from this section of the other institutions in the list being insignificant. The largest representation in the individual states is found at the following universities: Alabama—*Cornell*, *Columbia*, *Pennsylvania*; Arkansas—*Harvard*; Indian Territory—*Illinois*; Kentucky—*Harvard*, *Yale*, *Pennsylvania*;

Louisiana—*Harvard*; Mississippi—*Columbia* and *Cornell*; Oklahoma—*Michigan*; Tennessee—*Yale*, *Cornell*, *Columbia*; and Texas—*Yale*, *Cornell*, *Columbia* and *Pennsylvania*. Kentucky sends by far the largest delegation to the institutions included in the list.

In the north central division the three universities of that section, *Michigan*, *Illinois* and *Wisconsin*, naturally head the list, ranking in the order named. Of the three institutions *Michigan* draws the largest percentage of students from outside of its own state, 54 per cent. of its enrolment hailing from Michigan, the corresponding figures for *Illinois* and *Wisconsin* being 83 per cent. and 84 per cent., respectively. It is thus seen that the clientele of the *Universities of Illinois* and *Wisconsin* is much more local in character than that of any of the eastern colleges or universities included in the table, whereas *Michigan* attracts a larger percentage of students from outside its own state than do *Pennsylvania*, *Columbia* and *Cornell* or *Lafayette* and *Lehigh*, *Harvard's* percentage being just equal to that of the *University of Michigan*. Of the eastern universities *Yale* has the largest clientele in this section of the country, followed by *Harvard*, *Cornell*, *Columbia*, *Princeton* and *Pennsylvania*, in the order named, *Yale* and *Harvard* having exchanged rank since last year. Comparing the figures for the past academic year with those for 1904-05, we see that *Yale's* representation has increased from 506 to 536, the greatest gain (119-135) having been made in the state of Ohio; *Harvard* has dropped from 526 to 487, the largest loss (160-137) having been experienced in the same state; *Cornell's* representation in this division has remained stationary, 381-380, *Columbia's* has grown from 262 to 287, *Princeton* has 219 this year as against 209 in 1904-05, while *Penn-*

sylvania has the same number, 139. Of the New England colleges *Dartmouth* has the largest following in the north central division, with *Williams* a close second, the latter having twice as many students from this section as *Amherst*. The representation of *Lafayette* and *Lehigh* in this as well as in the western division is insignificant. *California* has thirty-seven representatives from this division, which is less than that of any of the other universities or the New England colleges. Leaving the *University of Illinois* out of consideration, *Michigan* has the largest following in Illinois, followed by *Wisconsin*, *Yale*, *Cornell* and *Harvard*, each of which has over one hundred students from this state. *Michigan* also leads in Indiana, followed by *Illinois*, *Columbia*, *Harvard* and *Cornell*. In Iowa the order is *Illinois*, *Michigan*, *Wisconsin*, *Harvard* and *Yale*; in Kansas, *Michigan*, *Illinois*, *Yale*, *Harvard*, *Columbia*; in Michigan (leaving the state university out of consideration) *Yale*, *Columbia*, *Illinois*, *Harvard*, *Cornell*; in Minnesota, *Yale*, *Harvard*, *Wisconsin*, *Columbia*, *Michigan*; in Missouri, *Michigan*, *Yale*, *Harvard*, *Illinois*, *Columbia*; in Nebraska, *Illinois* and *Michigan*, *Columbia* and *Harvard*; in North Dakota, *Michigan* and *Wisconsin*; in Ohio, *Michigan*, *Harvard*, *Yale*, *Cornell*, *Columbia*; in South Dakota, *Illinois* and *Wisconsin*, *Michigan*; in Wisconsin (leaving the state university out of consideration), *Illinois*, *Michigan*, *Harvard*, *Yale*, *Columbia*. The largest number of students attracted to *Amherst* from this section hail from Missouri, while the main strength of *Dartmouth* and *Williams* lies in Illinois. Excluding in each case the respective state university, the state of Illinois is represented by 1,091 students at the institutions mentioned in the list, Wisconsin by 240 and Michigan by 200, *i. e.*, 72 per cent. of the state of Illinois

representatives at all of the institutions included in the table are enrolled at the state university, while the percentage for Michigan and Wisconsin is 92.

In the western division (leaving *California* out of consideration) *Michigan* leads, as it did last year, with *Harvard* and *Columbia*, each of which attracts over one hundred students from this section, following; then come *Yale*, *Cornell*, *Illinois*, *Pennsylvania*, *Princeton*. *Amherst* and *Williams* attract only a few students from this division, *Dartmouth* being well represented only in Colorado. *Michigan* has grown from 134 to 149, its chief gain having been registered in Colorado; *Harvard* has dropped from 126 to 124, its main loss being in California; *Columbia* has grown from 111 to 117, the largest gain being in Utah; and *Yale* has grown from 78 to 93, the best gain being in Colorado. *Columbia* leads in Arizona, although the number is so small as to render the comparison of little value; in California *Harvard* still leads—leaving the state university out of consideration—with *Columbia* second; in Colorado the order is *Michigan*, *Yale*, *Harvard*; in Idaho, *Illinois* and *Michigan*; in Montana, *Michigan*, *Columbia*, *Harvard*; in Nevada, *California*, *Columbia*; in New Mexico, *California* and *Michigan*, *Harvard*; in Oregon, *California*, *Yale*, *Cornell* and *Harvard*; in Utah, *Columbia*, *Michigan*; in Washington, *California*, *Michigan*, *Pennsylvania*; and in Wyoming, *Michigan* leads. Of the states in the western division Colorado and California send by far the largest delegations to the eastern institutions in the list. The fact that the *California* figures are those for 1904–05 somewhat mars the value of the comparisons in this division, although the figures for the academic year just closed would probably show little change. The attendance of students from the state of Cali-

fornia at the eastern institutions will undoubtedly suffer a considerable loss in the coming year.

Cornell again leads in the number of students from the insular possessions, with *California* second, and *Harvard* and *Illinois*

(B) FOREIGN COUNTRIES

1905-1906	Amherst	California	Columbia	Cornell	Dartmouth	Harvard	Illinois	Lafayette	Lehigh	Michigan	Pennsylvania	Princeton	Williams	Wisconsin	Yale
North America.....	2	7	46	48	2	51	10		17	21	37	7		11	27
Canada.....	2	6	31	26	1	40	3		1	13	8	4		1	25
Central America.....			1	4			1				13			1	
Cuba.....			7	12		2			9		7			1	
Mexico.....		1	6	6	1	6	6		5	7	3	2		5	1
West Indies.....			1			3			2	1	6	1		3	1
South America.....		2	9	30		1			3	2	9			5	1
Argentine Republic.....		1	2	7		1								4	
Brazil.....			1	11							6			1	1
Chili.....			3							1	3				
Colombia.....			2	1					1						
Ecuador.....				2					1						
Peru.....		1	1	9					1						
Europe.....	1	5	50	22	1	32	6		1	12	49	7		4	21
Austria-Hungary.....			2								2				
Belgium.....			1								1				
Bulgaria.....				1						1	1				
Denmark.....		1												1	1
France.....	1		8	1		6					15	1			3
Germany.....		1	12	2		6	1			3	5		5		
Great Britain and Ireland.....		3	11	4		9				2	10			1	4
Holland.....			1	2		1				2	1				
Iceland.....						1									
Italy.....			2			3	1				4				
Norway.....				3		1	2								1
Portugal.....							1								
Rumania.....											1				
Russia.....			6	2							7				
Spain.....			2				1								
Sweden.....			2	2					1		1				
Switzerland.....			1	1											
Turkey.....			2	4	1	5				4	1	1			12
Asia.....	4	18	38	20		21		3		12	14	5	2	6	31
Ceylon.....												1			
China.....		9	10	9		3		1		1	1				4
India.....	1	1	3	7		1		2		2	1		1		1
Japan.....	3	8	24	4		16				9	11	4	1	6	24
Persia.....			1												
Turkey (in Asia).....						1					1				2
Africa.....		1	4	2		2	1		1			1	1		2
Cape Colony.....												1			
Egypt.....							1								
Morocco.....						1									
South Africa.....		1	4	2		1			1				1		2
Australasia.....		6	3	8		5	1				21				3
Australia.....		3	2	7		1					14				3
Friendly Islands.....		1													
New Zealand.....		2	1	1		4	1				7				
Total (Foreign Countries)	7	39	150	130	3	112	18	3	22	47	130	20	3	26	85
Total (United States).....	453	3268	4083	3255	995	4319	3447	347	634	4133	2914	1364	445	3216	3063
Grand Total.....	460	3307	4233	3385	998	4431	3465	350	656	4180	3044	1384	448	3242	3148*

* Omitting 64 non-resident graduate students.

third. *California* leads in the Hawaiian Islands, and *Cornell* in the Philippines and in Puerto Rico. There is quite an increase in the total number of students from the Philippine Islands and Puerto Rico over last year at the universities included in both this and last year's tables. Alaska is not represented this year at any of the institutions in the list.

As was pointed out in the introductory paragraph, the gain during the past year in the number of students from foreign countries has been quite marked, the increase for the six eastern universities included being one from 540 to 627, a growth of no less than 16 per cent., to which the various continents contributed as follows: North America's representation has grown from 212 to 216; South America's from 37 to 50; Europe's from 116 to 181; Asia's from 107 to 129; Africa's remained stationary at 11, and Australasia's has dropped from 57 to 40, this loss being attributable chiefly to the decrease of 15 in the figures for the *University of Pennsylvania*, which attracts the largest number of Australasians.¹ A glance at the accompanying table will show that *Columbia* has the largest foreign clientele, having exchanged places with the *University of Pennsylvania*, which this year is tied with *Cornell* for second place, *Harvard* occupying fourth, as it did last year. The attendance from foreign countries at *Columbia* has grown from 117 to 150 during the past year, that of *Cornell* from 100 to 130, that of *Pennsylvania* from 126 to 130, that of *Harvard* from 94 to 112, that of *Yale* from 83 to 85, that of *Michigan* from 38 to 47, and that of *Princeton* has remained stationary at 20. Of the western universities *Michigan* attracts the largest number of students resident in foreign countries,

¹ A portion of the information contained in this paragraph was published in the *New York Evening Post* of July 21, 1906.

followed by *California*, *Wisconsin* and *Illinois* in the order named. It will also be noted that the attendance of foreigners is almost exclusively confined to the larger universities, although *Lehigh* during 1905-06 attracted 22, as against 7 for *Amherst*, and 3 each for *Dartmouth*, *Lafayette* and *Williams*. *Lehigh's* excellent showing in this direction is explained by its reputation as a technological school, this particular field being the one that draws the majority of foreign students, although the foreign clientele in the non-professional graduate faculties of the larger universities is rapidly on the increase. It is safe to predict that the growth in the number of foreigners attending our higher institutions of learning will be as uninterrupted in the immediate future as it has been during the past few years. Examining the representation of the different institutions by continents, we note that the order in North America is *Harvard*, *Cornell*, *Columbia*, *Pennsylvania*, *Yale*, *Michigan*; in South America, *Cornell*, *Columbia* and *Pennsylvania*, *Wisconsin*—*Cornell* being the only institution in the list that makes a respectable showing; in Europe, *Columbia*, *Pennsylvania*, *Harvard*, *Cornell*, *Yale*, *Michigan*; in Asia, *Columbia*, *Yale*, *Harvard*, *Cornell*, *California*, *Pennsylvania*; in Africa *Columbia* leads, while in Australasia the order is *Pennsylvania*, *Cornell*, *California*, *Harvard*. The two most interesting phenomena to be observed here are the rapidly increasing delegations from Europe on one hand, and on the other the comparatively meager showing made by South America. It certainly seems strange that the South American republics are not better represented by students at the universities of the United States. As for individual countries, *Harvard* leads in Canada, followed by *Columbia*, *Cornell* and *Yale*; *Pennsylvania* has the best Central American representation; *Cornell* attracts the largest num-

ber of Cubans, *Michigan* the largest number of Mexicans and *Pennsylvania* the largest number of West Indians. Of the North American countries, Canada sends the largest number of students—161—followed by Mexico with 48 and Cuba with 40. *Cornell* leads in the Argentine Republic, Brazil, Ecuador and Peru; *Columbia* in Colombia, and with *Pennsylvania* in Chili, although the representation in the last two countries is insignificant. Of the South American countries, Brazil sends the largest representation, namely, 20, followed by the Argentine Republic with 15 and Peru with 12. In the European countries that send ten or more students the order is as follows: France—*Pennsylvania*, *Columbia*, *Harvard*; Germany—*Columbia*, *Harvard*; Great Britain and Ireland—*Columbia*, *Pennsylvania*, *Harvard*; Italy—*Pennsylvania*, *Harvard*; Russia—*Pennsylvania*, *Columbia*; Turkey—*Yale*, *Harvard*. Great Britain and Ireland sends the largest number, namely, 44, followed by Germany with 37, France with 35 and Turkey with 30. Of the Asiatic countries, Japan sends 110, China 38 and India 20, the representation from the other countries being unimportant. *Columbia* draws the largest number of students from China, leads with *Yale* in Japan, and follows *Cornell* in India. Of the Australasian countries, Australia sends 30 and New Zealand 16, *Pennsylvania* leading in both, followed by *Cornell* in the former and by *Harvard* in the latter.

RUDOLF TOMBO, JR.

SCIENTIFIC BOOKS.

The Analysis of Racial Descent in Animals.

By THOMAS H. MONTGOMERY, JR., Professor of Zoology in the University of Texas. Pp. xi + 311. Henry Holt & Co. \$2.50.

A general and comprehensive work on the methods of determining racial descent has not appeared within recent years and Haeckel's 'Generelle Morphologie,' first published in 1866, still remains the standard work on this

subject. The insufficiency of some of the methods outlined by Haeckel has been repeatedly pointed out, but there are few, if any, works which deal with these methods both critically and constructively. Recent analytical studies in biology have turned the interest and sympathies of many biologists away from the more general, if less exact, speculations of the older school, and have brought the study of phylogeny into a certain disrepute. Nevertheless, as the author says in his preface, "many of the broader concepts of biology have been obtained from just such investigations. As to the degree of uncertainty in its conclusions, this results simply from the great extent of the phenomena to be explained and from their complexity."

The first chapter of this work deals with 'Environmental Modes of Existence.' In addition to the general classification of organisms into the *geobios*, *limnobios* and *halobios* of Haeckel, the author recognizes two other groups—the *diplobios* (organisms which spend part of their life in one medium, part in another) and the *entobios* (entoparasites); the first three of these modes of existence he groups together under the name *monobios*, the last two under *heterobios*.

The question as to which of these modes of existence is the most primitive is interestingly discussed and the conclusion reached that the evidence favors the hypothesis of Simroth that 'the sea beach from the region of high tidal limit to a short distance below the low tidal, is the probable point of origin of most animal groups.'

Regarding the seasonal migrations of various animals the author concludes that there is no evidence that the earliest environment of the young represents the ancestral home of the species. As to the method of origin of entoparasites he concludes that where there are a number of different hosts in the life history of the parasite, *e. g.*, Trematodes, the host in which the adult condition is reached is the primitive one, whereas the occurrence of younger stages in an intermediate host is a later adaptation. "Here the ontogeny would be a reversal of the phylogeny with regard to the sequence of hosts."