### **Amherst and Wellesly College Anthropometric Tables**

### **Publication/Creation**

1892

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Hitchcock



THE

# ANTHROPOMETRIC TABLES

AMHERST COLLEGE.

1892.

f.La Hildrock Authropometric Tables

# THE

# \* RESULTS OF ANTHROPOMETRY, \*

AS DERIVED FROM THE MEASUREMENTS OF THE STUDENTS

IN AMHERST COLLEGE.

A PAPER PRESENTED TO THE AMERICAN ASSOCIATION FOR THE AD VANCEMENT OF PHYSICAL EDUCATION AT THEIR ANNUAL MEETING IN PHILADELPHIA, APRIL, 1899.

> AMHERST, MASS.: Press of Carpenter & Morehouse, 1892.

# PHYSICAL MEASUREMENTS AS AFFORD-ING A BASIS FOR THE DETERMINA-TION OF THE IDEAL MAN.

More than a century ago, Sir Joshua Reynolds in England used this language:

"From reiterated experience and a close comparison of the objects of nature, the artist becomes possessed of a central form from which every deviation is deformity. \* \* \* \* And as there is one general form which belongs to the human kind at large, so in each of these classes there is one common idea and central form which is the abstract of the various individual forms belonging to that class. But I must add further, that though the most perfect forms of each of the general divisions of the human figure are ideal, and superior to any individual forms of that class, yet the highest perfection of the human figure is not to be found in any one of them. It is not in the Hercules, nor in the Gladiator, nor in the Apollo; but in that form which is taken from them all, and which partakes of the activity of the Gladiator, of the delicacy of the Apollo, and the muscular strength of the Hercules."

The object of this article is not to exhibit on paper or in figures the ideal human form, but believing there is an ideal form as conceived in the Divine mind, and that this ideal is by no means as yet present to us in the bodies of our young men; but to show that the studies here presented may give us some glimpses of this ideal, and how we may approximate to it. Or, perhaps it is better to say that these studies show us what is the best human form and proportion as it actually exists to-day, and then from the special and peculiar excellencies as brought out in these researches, we can set ourselves to work to see if we cannot elevate the average to a higher ideal.

But firstly let us bring up a little past history of the study of the human form in ideal.

The Sanscrit manuscript written in the early Christian centuries is the oldest literature on this subject. It is called the Silpi Sastri, and with great exactness and precision divides the human body into nine portions, and 480 parts.

The hair,	15
The face,	55
The neck,	25
The chest,	55
From the chest to the navel,	55
Thence to the pubes,	53
" knee,	90
The knee itself,	30
The leg and foot,	102
	480

And by a most "occult" administration of a tangle of squares, circles and triangles it was "demonstrated" in this manuscript what the perfect human form might be expected to resemble.

A Greek sculptor Polykleitus about 400 years B. C. has left a treatise called the "canon" on human proportions. This was illustrated by a marble statue called Doryphorus, or Spear Bearer, which was said to have been of "perfect proportions." But the model has disappeared.

Phidias, still later, employed twenty models, borrowing from each of them the most beautiful parts "permitting him to arrange them with all the necessary strength and dignity."

And other schemes have been devised, and have perished, by other lesser lights among artists ancient and modern, endeavoring to tell us what is the perfect or ideal human form.

But near the beginning of the present century, as scientific methods have come to the front to confirm or overthrow theory as it may be true or false, the artistic conception has been asked to wait a little while, until patient, plodding, scientific investigation shall show us what we now have on hand to enable us to try and construct the artistic ideal.

And the first investigator in this field of research is no less a man than Baron L. A. G. Quetelet of Belgium, in the prime of his activities from 1850 to 1870. His work which we find under the different captions of "proportions," "superficial extent," "development," measure of the different faculties" and "theory of probabilities of the human body" he most carefully carried out by observation, experiment, and use of the doctrine of means and averages over an immense field of investigation. And to Baron Quetelet we must give the title of the Father of Anthropometry.



Since the year 1884, the American Association for the Advancement of Physical Education has received, and there have been read at its annual meetings many papers on anthropometry and its kindred subjects. It has also adopted a definite method of ascertaining the proportions of the human body mainly as derived from measurements made in colleges, schools and the Y. M. C. associations.

Working in the very close direction of the method adopted by this association, the Department of Physical Education in Amherst College has been making a prolonged and careful study of the physical statistics of all of the nearly 3000 students who have been connected with this Institution during the last thirty years. The results of study have been carefully preserved, collected and tabulated in several different ways, and the most important of them are appended to this paper. It has not, however, been the design in it all, to labor according to any preconceived theory or model, but merely to gather together the facts, and then find out the law or method which they seem to outline or foreshadow.

This large mass of measurements has been looked at, arranged and tabulated in the following different ways.

The first one is in the common method of taking the Average of each item of all the students measured. This means, adding together the measures of each student, and then dividing the amount by the total number of students observed. This is to be found under the table of the Average Student.

As twenty-one years is considered by common law to be the date of arriving at full manhood, the measurements of those who were between Twenty-one and Twenty-two Years of Age are arranged and exhibited under the table The Student Twenty-one Years Old.

For the sake of further unfolding the subject, these measurements have been arranged and tabulated according to the doctrine of means, or, of mean proportions. The method of securing this, is, to arrange all the items in groups with a common difference, from the least to the greatest, when we readily find the group with the largest number, which represents the mean number of the whole. This is found under table 3, or the one of the Student of mean proportions.

Another way of illustrating these results is the grouping of all the items by the Ages of the Individuals. The ages as studied here have been from sixteen to twenty-six. This is the Table of Ages.

The Percentile Method is another way of expressing the results of these measurements. This method is analogous to that of the

"means." The items here are all arranged in order from the greatest to the least, when five per cent. are counted off for the first division, ten more for the second, and so on down to fifty per cent., which corresponds very closely with the "average," or "mean," as already described. These five divisions indicate a measure above the fifty per cent. Then another division of ten per cent. indicates forty per cent. below the fifty per cent. division; and another ten, per cent, thirty more below, and so on to the minimum of five per cent.

The last table is that with STATURE for a basis of comparison. Here all the items are grouped together under the differing body heights, from the lowest to the highest with the variation of one centimeter, or about half an inch in each group. For instance, taking the lowest group measuring 1600 m. m. or 63 inches, all men of this height—1600 to 1609— are tabulated together and each of the fifty-four items averaged to secure the standard of measurements for men of the heighth of 1600 m. m., or 63 inches. Then the other heights, 1610, 1620 and so on up to 1830 m. m., or 72 inches, are tabulated in the same manner. This is the table represented By Heights.

Thus are brought side by side six different ways of studying the anthropometric results obtained from the students of Amherst College. And it certainly is both instructive and interesting to see the close relation of results in these different methods, and very likely if we feel that we must adopt one of these several methods, we shall have to be on our guard lest we should need the advice of the countryman to the traveler who inquired which was the best of three roads before them, "all of them lead you there, but whichever one you take before you get there you'll wish you had taken the other."

For, without doubt, age, weight, stature and per cent. are each important factors in this problem, when we are to treat it in a cosmopolitan manner. But for educational and developmental study, where so much of the need of physical training now lies, for the training, strengthening and developing weak and poorly developed bodies, the Standard of Stature seems the safest and surest to work from. The painter and sculptor certainly makes his dimensions of size according to the height of the subject he is placing on canvas or in marble. There are certain limits to the outline of the tall person which he would not give to a shorter figure, even if the age were exactly the same. He would not add the encumbrance of fat to the figure short and chubby, even though the theory was ever so strong that just so much adipose must be there all the same, no matter

what the lengths of the bone so warmly covered up might be. And it seems rational to suppose that the capacity and size of the vital organs, and the strength of the muscles, to move the longer or shorter levers will be proportioned to the length of trunk and limb, rather than to the mere weight of the tissues. Also the facts are established, beyond doubt, long ago, that the size of the lungs and some other vital organs, depends in each individual case upon the bodily stature, so many additional cubic inches of lung capacity for each inch of stature. And as strength of muscle depends on the number rather than the length of its fibers, we shall see that the long arm or leg needs a thicker muscle to move it than does a shorter one. Hence the trunk, arm or leg of the person a little longer than another of exactly the same age or weight, would require a little longer girth measure, to endue it with the strength proportioned to the size.

It will not, however, be right to dismiss this subject without presenting to this association the opinion of Mr. Charles Roberts, the foremost authority on anthropometry in Great Britain to-day. In treating of the subject in "index columns, age columns and result columns," he sums up the whole by saying, "the total height being the most characteristic and important measurement of the body, the arrangement of the table of heights has been made the model for all the rest."

In concluding, it seems safe to say, that the examination of the tables constructed on Bodily Stature as a datum give strong support to the idea that this element is the determining basis for an anthropometric standard whether of the ideal man, or for rational deductions and prescriptions for a better or more normal rate and quality of bodily growth.

It is a pleasure and privilege to say that the preparation and printing of these tables, and the offer of a copy to each member of this association is made possible by the endowment of a "contingent fund" for anthropometric, and its kindred work in Amherst College by Dr. Rufus P. Lincoln in New York.

# Anthropometric Study of the Students of Amherst College.

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# Anthropometric Study of the Students of Amherst College. 6. TABLE OF HEIGHTS.—1822 MEASUREMENTS.

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m. 6	A REAL PROPERTY AND ADDRESS.	- No. 4 12.2 24.5 25.2 28.4 24.4 20.4 12.9 15.9 15.5 15.5 2.2 10.2 11.4 10.1 10.0 10.8 10.6 10.5 10.1 16.5 16.4	6.0 4.236.9 7.7 10.0 13.0 34.4 34.3 17.2 37.9 10.1 10.0 40.7 67	0 1.3 136 6 9 163 40 37 441 7 2.9 200 259 88 82	3.65
rm. 6		- 47: HER BED WIG TOR 460 RED SEE HES SON DAY NAS 939 YET 297 207 155 T49 945 767 757 166 164	103 108 451 196 253 332 368 265 457 456 259 258 1770 176	0 1.1 137 6 9 164 40 37 470	3.66
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# Anthropometric Study of the Students of Amherst College. 7. TABLE OF PERCENTAGES.—2280 MEASUREMENTS. The black figures represent millimeters, kilograms and liters; the red, inches, pounds and cubbe inches.

-		100		111	nom	THL.													- 0	IRTI	18.												T				- 1	HEKA:	DTH	6.					LEN	67218					THE	NGTH	9.			60%
PIER CENT.	wescille	Body.	Meritan.	Cornel		Puber.	Shiling	Total C	1000	Nest.	Chest Repose.	Chest Polls.	Belly.	fflps.	Hight Thigh.	Left Thigh.	Right Knee.	Left Knee.	Right Culf.	Left Calf		donor make	Left Instep.	Upper Right Arm ConfraTel	Upper Elight	Upper Left	Elght Ellow.	Laft William		Sight Presum	Left Forestm.	Eight Wrist.		Read.	Neck.	Shoubler.	Walst.	10ps.	Shppies.	Elght Shoulder Ethew.	Left Sheabler Elbow.	Eight Ellow	Left Elbow Tip.	Right Foot.	Left Foot.	Stretco or	Herizontal Length	Langs.	Bisch.	100	Pall	Light	Elght Forestw	Left Fortarm.	Total	CAPACITY O
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0	51	2.4 64	25 13	19 1	62 3	95 4	32 85	3 3	45 2	2.8 8	500 . 5.7 5	548	064	829 12.0	663	459	329	18.	51	4 31 3 12	3 2	24 2	124 5.5	258 10.7	227	32	22	9 25	14 2	39 2	30 1	153 15						301									1637	0.7	231	0	3	112	61.5	26 57.8	509	2.93

# ON SOME RELATIONS OF HUMAN STATURE TO MUSCULAR STRENGTH.

It seems to be a prevailing idea, that the physical strength of men when ascertained by comparative tests and in bodies well proportioned to the height is greatest in those of shorter bodily stature. Of course the acts of leaping, walking, throwing a ball and similar feats would be better exhibited by men of longest limbs, because of longer leverage of trunk, arm, and leg. But when the muscles of a man are made to contract upon his own weight alone, we have been apt to think that the man of short joints has a better mechanical advantage against gravity than has the longer limbed fellow.

alone, we have been apt to think that the man of short joints has a better mechanical advantage against gravity than has the longer limbed fellow. Such has certainly been the notion with the Physical Education Department at Pratt Gymnasium, Amherst College. But in order properly to test this opinion by numerical and statistical facts, some special observations have just been made at our Anthropometric Laboratory. Following the arrangement and method accepted by the American Association for the Advancement of Physical Education, the six strength tests of back, legs, forearms, lungs, dip and pull up, have been used for this study. These were taken of the twenty tailest men and the twenty shortest men in the classes of '89, '90, '91 and '92, and they have been collated, arranged, and averaged for the best purposes of comparison.

The accompanying tables show the aggregates of the items selected in each classs of the tall men and the short men, the averages of each item, and the difference between them both in numbers and in personal

and the difference between them both in numbers and in per cent.

We find as a result of the study that the average height of the tall men is 1809 m. m. or 71.3 inches, and that of the short men is 1665 m. m. or 65.5 inches. And as the average of a college student for the past 31 years has been 1725 m. m. or 67.9 inches, it shows a wider range between the average and the short students than the reverse.

We also find the per cent. of difference between the tall and the short men, in the three points in which the tall men surpassed the short ones was 14.50. And the three points where the short men surpassed the tall ones gave an average of 10.25 per cent. So that taking the whole six items of comparison together we find 4.25 per cent in favor of the tallest men.

As far then as this little study is concerned it seems to show that the idea that the men of short stature exceed those of tall stature in test measurements of strength is erroneous.

The Department here has taken the ground that the Stature (bodily height) is the normal or proper standard for physical work. That according to a man's height we should apportion his work, prescribe for his health, predict his development and construct the typical man, or as Mr. Charles Roberts puts it "the total height being the most characteristic and important measurement of the body, the arrangement of the table of heights has been made the model for all the rest." And this monograph showing that the men above the average height give a greater range of strength than those below it, and that the strongest men are among the tallest, give great promise to the proposition that stature is an all important factor in the study of anthropometry.

TABLE OF TEST MEASUREMENTS OF BODILY STRENGTH BETWEEN TALL AND SHORT MEN IN AMHERST COLLEGE, MARCH, 1893.

			1.75	LLL DO	TEN-			
		Height.	Back,	Legs.	Forearms	Lungs.	Dip.	Pull Up.
Aggregates.	Class of '89, Class of '90, Class of '91, Class of '92,	1814	3262 3343 3347 3262	3867 4285 3999 4249	897 935 834 906	328 348 326 312	152 168 115 156	195 203 167 197
700	erage,	1809	165	205	45	1.64	7.4	9.5

			SH	ORT M	EN.			
		Height,	Back.	Legs.	Forearms	Lungs.	Dip.	Pull Up.
Aggregates.	Class of '89, Class of '90, Class of '91, Class of '92,	1680 1652 1651 1677	3017 3030 3080 3190	3507 3395 3443 3606	794 781 737 744	316 339 364 314	174 182 177 151	281 199 250 192
Di Di	erage, fference n measure, fference n per cent.,	1665	154 11 7.25	174 31 17.75	38 7 18.50	1.66 0.02 1.25	8.5 1.1 14.75	10.9

Height in millimeters; Back, Legs, Forearms and Lungs in kilos; and Pull and Dip in units.

AN ANTHROPOMETRIC TABLE

CONSTRUCTED ON THE PERCENTILE METHOD.

Compiled from 2230 measurements of Amherst College students between 1884 and 1891. Arranged according to the percentage as indicated at the left. The black figures indicate Millimeters, Kilograms, Litres, and Units: the red Linear Inches, Pounds and Cubic Inches. The average age of the individuals observed is 20 years and 4 months.

F			HE	igh:	r.		-													GI	RTI	t.												1				BRE	ADT	II.						LES	GTE	T.	1			81	TRES	SGT	L			9
WEIGHT.	Hadada	Stersum.	Navel	Puber	Kinda			Bead.	Seck.	Chest repose.	Chess full.		deny.	Hips.	Right Thigh.	Len Thigh.	Right Knee.	Laft Kine.		Right Calc.	Left Calf.	Right Instep.	Left Instep.	Upper Right	Upper Upper	Unter	Left Arm.	Right Ethow.	Left Elbow.	Eight Forearm.	Left Forearm.	Elght Wrist.	Left Wrist.	Head.	Nock.	Shoulders.	Walse.	Mbs.	Nipples.	Right Sheat.	Left Shoul.	der Elleur.	Tip	LARIT ESPOYT	Eight Foot.	Left Foot.	Stretch of Arms.	Horizontal	The Assession	- dheet	Beck	Chest bip.	Chest Pull Up.	Legs.	Right Forearm.	Left Forcarm.	Total.	CAPACITY
5 51.0 10 55.1 10 55.1 10 55.5 101. 50 57.6 10 50.5	4 6 10 10 10 10 10 10 10 10 10 10 10 10 10	165 E33 6,1 50 167 E33 6,9 50 154 E36 5,9 50 160 E38 1,6 54 110 E36	19 96 .6 87 80 95 .8 84 .7 20 .6 10 .3 99 .6 10 .1 00	2 79 .5 81 70 80 81 82 82 82 81 83 81 84 81 81 81 81	0 40 0 12 12 4 0 17 0 43 0 43 17 18 17 18 18 14 44 16 18	02 5 7.0 10 82 5 7.4 10 13 8 7.8 10 10 8 1.1 10 10 8	53   1,6   1   1   1   1   1   1   1   1   1	545 11.5 550 11.0 556 21.5 560 21.0 564	304 11.8 330 11.0 208 13.3 341 13.5 348 15.7	805 81.1 821 81.4 844 81.5 836 836 836	54 33 64 33 64 34 35 31 31 31	8 6 2 9 1 6 9 9 4 7 8 7 8 7	64 : 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	100 10.0 10.0 10.0 10.0 10.0 10.0 10.0	463 18.2 474 18.7 487 19.9 486 29.5 500 19.9	430 18.0 420 18.2 483 19.0 492 19.4 500 19.2	333 33. 33. 341 341 341 341 341 341	31 3 13 3 13 3 13 3 13 3 13 3 13 3 13 3	10 2 10 2 10 3 10 3 10 3 14 3 15 7 17 3 14 3 16 1 16 1 16 1	114 2.3 120 2.6 129 2.9 129 136 3.2 141	313 12.5 220 12.6 229 12.9 313 13.2 540	224 8.8 220 9.0 213 9.1 240 240 244	924 8.5 939 9.0 933 930 9.3 9.4	250 10. 263 263 263 283 11. 281 11.	8 20 3 9. 5 23 4 9. 6 94 8 9. 8 9. 1 9. 9 9. 4 9.	7 21 0 8 4 21 8 9 5 3 7 9 7 9 8 9	21 2 1.2 1 20 2 1.3 1 1.4 1 1.5 1 1.5 1	129 9.0 9.3 9.2 39 9.4 9.4 9.5 9.5	294 8.8 229 9.0 234 9.3 209 9.4 242 9.5	295 9.4 243 9.5 550 9.8 555 10.0 250 10.3	250 9.1 257 9.4 242 9.5 249 9.8 252 9.0	155 6.0 156 6.1 150 6.3 161 6.3 161	151 0.0 154 6.0 138 6.2 100 6.3 161	145 5,7 147 5,8 149 5,9 159 5,0	\$0 \$.0 \$06 \$.0 \$105 \$.1 \$105 \$4.7	2003 15.5 4602 25.5 433 16.6 473 16.6	250 9.1 285 9.3 240 9.5 245 9.7 249	306 11. 306 12. 313 12. 311 12.	173 6. 178 7. 184 1.7. 189 7. 191	344 350 350 350 360 361 361 361	8 15 8 15 8 15 1 16 1 16 1 16 1 16 1 16 1 16 1 16 1	1.5 1 1.8 1 1.8 1 1.0 1 1.0 1 1.0 1 1.0 1	08 4 0.8 1 0.8 1 00 6 1.1 1 0 64 0.5 1 01 4 0.6 4	05 0.8 7.0 44 7.5 49 7.7	940 9.5 9.5 9.7 51 9.9 254 10.0	941 9.4 9.5 9.6 9.9 9.9 254 10.0 857	1670 65.7 1705 67.9 1749 68.8 1760	1635 64.5 5486 65.5 1067 66.5 1786 67.5	0. 1. 1. 1. 1. 2. 1. 2. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	9 21 11 12 12 12 12 12 12 12 12 12 12 12	9 4 15 4 14 1 7 2 16 1 16 4		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	122 247 124 273 39 306 449 328 157	28 61.7 50 61.1 23 72.8 35 77.2 87	26 57.8 29 63.9 31 68.3 72.8	509 681 524 524 505 406 807 411	2.90 178 5.30 190 2.00 2.17 2.77
0 61.6	S S	24 141 .8 55	5 60	29 Bi	1 11	7 1	85 G	500 12.4	351 16.8	885 34.8	93	4 0	10 1	5.1	514 30.0	510 20.1	336 14.	33	2 1	147 1.7	345	942 9.5	241 8.5	200	6 23 6 30	3 9	50 9	150 1	947	2010	256 10.1	165 6.5	D83 6.4	153 6.0	108	433 17.0	933 10.0	325	196	377	87	1 0	1 4	39 8-1	200	200 10.0	1780 70,4	17m	1.	113	0 0		9 1	173	\$0 95.0	37 11.0	455	3.8
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### ANTHROPOMETRIC TABLE

Arranged according to the percentages at the left, from the measurements of fifteen hundred Wellesley students. The black figures indicate millimeters and kilograms; the red, inches and pounds. "Lung Capacity" is given in litres and cubic inches.

Measurements Taken and Compiled by M. Anna Wood, Wellesley College, Wellesley, Mass.

8					111	HOR	T.															GUET	TH.												DEPT	16.	BI	KEAD	TH.				1	ENG	TIL.				STRE	ENGT	И.	
PRR CES	AGE,	WESGREE	Height	Shing	Kore.	Pales	Name	Sternam.	Head.	Mark	outer.		Chest full.	Nisch Rib.	Nieth Rib-	Wislat.	Hips	Thigh R.	Thigh L.	Kees R.	Kare L.	Cast R.	Colf.L.	Ashle R.	Askis L.	Instey R.	lastep L.	Uparm R.	Opening		Portsum	Portame.	Wrist R.	Wrist L.	Chest.	Abdomes,	Head.	Necs.	Wales,	Hilps.	Nipples.	Sheatler Ellere R.	Shoulder Kilson L	Tip R.	Tip L.	Foot R.	Streets of Arms.	Bach.	Legn.	Chest,	Forestra R.	Porental.
1	20.6	75-3	171	5 90	457	Spa	rodu	1418	20	1 3	46 8	40 1	904	255	Bug	240	1000	490	490	401	4100	396	314	230	4,07	140	P63	NO 3	200 0	N. 45	1 19	254	170	100	814	nii.	100	100 4	O 2	64 35	5 200	307	32%	400	450	etq.	10 120	100	120	41	JA.	35
ă	RG-0	2111	121	9.90	5 1457	754	2049	7474	- 59	6 1	39 /	300	803/	391	253.	-216	1045	480	934	40	410	396	373	230	230	April .	A308	315 3	00 A	4 45	il se	1 147	104	166	900	212	Hig	110 -3	100 ×	96 37	345	321	339	454	457	101	259, 154	3 201.0	921	5%	39	35
i		60-6	109	is No	414	Sqi	1000	Agree Agree	52	9 3	1) J		907	700	700	698	900	603	641	300	3940	307	305	807	207	A50	215	900 3	7 (F)	(F. 24	9-5 E 645	9.5	100	154	199	209	160	104 3	(1) NO.	45 36	9-0 8 AS	300	200	ALC	ACC	957	90% 12P	7 200-0	149	36	3/5	300
,	10.7	99-7	1009	× 10	5 438	E 948	2091	1324	(1.57)	6 3	PSC 2	960 (	Spt	5000	713	6991	90%	600	day	354	3251	3/17	350	200.8	SHE	ASH	ASS C	syll 2	99EL #	S N	4 20	8 457	100	1000	195	197	106	100 . 3	60 a	44 35	4 . 291	-360	350	44%	410	866 :		116.1	136	35	35	20
	40.10	BILLS	100	E 57	1 429	( Sing	0.000	3301	.53	9 3	800 3	Chi I	Succ.	608	733	000	990	ded	594	322	325	350	300	210	219	220 -	865 .1	AQCT A	No. of	PE NO	N . #31	0 433	: 150	159	150	106	155	100 ]	150 1	135 14	G 200	342	1 -3/05	- 614	448	Xeb	245 HG	a 125-3	7 104	120	100	45
	\$0.4		100	(A) - 8(2)	6 400	: 8eo		1357	11-50	60.3	280.15	235-1	Sign 1	600	716	462	043	4560	-613	359	350	151	357	317	317	200 -1	2001 ·	250k - 2	the at	OF - 25	P - 252	1 120	718300	1536	450 · I	5811	107	1105 3	OS: 8	20 : 34	4 222	3.054	101	4405	415	8420		d Ho	117	- 50	305	100
	30.11	ga.a	104	9 80	400	1,004	.900	1361	139	9 3	10, 7	95	Nog -	191	713	190	933	375	577	309	300	354	353	814	815	845	Deg .	eta, y	77 (4)	Pi (A)	( 33)	2 20	. 40	157	185	xtig	152	142 3	05 - A	13 34	219	381	394	4105	435	Aph	MS. 100	16g.1	01110	.30	.70	AS
	30.5	52.8	153	E 80	419	1	961	1300	The second	8 10 8 1	0.3	100		644	710	46	943	574	524	3%	394	351	35%	212	215	334 "	208	470 3	76. K	16: 10	1 20	804	155	P.530	100	risa	150 1	100-3	(B) (B)	0 38	816	349	349	434	4380	P-7 9	43 195	6 195,5	264.65 MG	99	N-11.5	95
																	914	97	5%	350	155	167	380	210	MIL	III 3	MI I	(Z) 1 15	(R) PJ	2 24	9 - 944	50.0	1,50	954		79	153	102 3	10 81	111	Big	340	200	451	470			11/2			44.5	
	20.0	115.0 85-9	104	0] 75	415	377	950	1324	59	V 3	14 2	MI -	802	504	200	454	910	\$50	339	307	363	341	343	F10.	819C	8A0 1	eg I	P24 P	950 A	PE :M	324	- ARI	155	1153	129		154	104 3	95 (1)	4 33	913	346	394	420	470	āgi i	ign stig	9 145-1	198	45	97	94
	90.	51-9	12	A) 59	413	250	101	1319	55	5 31	13 7	32 1	Signa Li	day	-690x	dag	gire	533	353	354	TEST	31/1	342	200	200	ging 1	mb o	121 9	95 A1	0: 22	(r 24)	415	150	154		125	155	10g - 3	p60 *	46 27	f No	367	349	687	675	£50 -	201, 1640	g tyle	95	10	26	30
		54-3	160	s Set	410	223	1008	130	5 005	1 30	10 3	18 7	205 3	604	for	des	Non	540	105	301	1000	13/5	MIT	2005	3050	162	n6 1	rigil X	NO.	1 80	205	1966	103	161	YTS -	(1)	151	101 1	G 10	9 12	Box	540	1600	471	471	11/2	sir sta	1364	0.00	100	10	
	7000	119-4	((6)	2 35-	Heat	30-0	3511	\$7.0	90.2	9, 19	2 2	-5 2	1-4 1	40	$\mathcal{R}_{j}^{0}=0$	94-0	35-14	25.0	20.6	15/8	10-0	that I	0-0	5-1	1-1 1	1-5 9	-5 11	10 10	4.175	5-0	5.6	8-5	6,	5-0	1641	1.5	6 4	110	3 5	G 316	8-1	13-4	H-C	16-7	16-7	PH 9	3 457	130.	200-5	60-3 J	7-5 4	H
	19-5		gaz,	9 23-	10.1	307	1019	37-0	80.5	150	10 3					54-4 644																																118-				
	19-5	ing)	4	7 35-	12.0	35-3	100	35.0	Ar.	10	3 4		Ang B	10.00	90-9	34-3	34-5	95.4								6619	14 10		3 19-	61,040	516	5.3	5-9			-2 3	1-9 4		1 5	d) the								100				
	19-3	1134			400			20-9	10	1 15	9 1	1 3	77		-		100	-			-								790	1000				-	171 0-7	2586	1-9 1			3 19-1								102				
	19.1	mi	150.	36-9		89-1	17.0	\$0.0		6	4	93	72 6											1-9	7-9-1	-3 8			135	354	8-3	8-6			6.7					4 100								8 116.0				
	18.11	1093	100	12-1		250	360	\$018	365	11	a h	7 3	D-4 3	19.6	25-1		33-0 5e4	20.6 \$16				120			D-8 1	1-3 8	1-3 10		9 7-	1 1/4/	3.1	8.3	13		0.0				9 5	di the		131	Ale:	19-3	10, 10, 1	60 19	1 60.	e infa	HI HOS-SI		F-5 4	
	13-7		156	3 32-1		20-4	30-0	Bir	301			303	D-F-3	13+4) 13+4)	26-	12-3	33-3	20-5	20.2	13:1		12.6	12.6	212.		58(3			2 7-	51 8-4	11.00	1.0	9-0	11年		1-5	5/2 3	14 ( 0			2.70	19-9	(18-5)					8 50	1954	45-3	15-3 3	
4	10-4	305.1	100	9 38.1	154	29.1	\$1-3	49-5	21.0			13 3	9-8-1	ej.b	8-1	89-1	32-9		19-9	329 13:	13-9	19:4: 1	1316	2/6	199	511. 3	bik i g	13 6	ASB.	1274	7-9	17:9	54	3.0		69 .		17 1	4 8	100	1 2-5	753	383	15-9	15-0	13/1	9 61.	4 16	187-0	41-9	H-3 3	17
	15.1	100.0	60.	3 31-1	19-1	85-7	36-5	89-1	M.	ğ 11	5 2		9-4	44.5	26-3	\$20°	32-4	19.0			14.7	10.0	19.9	7-5	7-5	Sc   3	10	10 9	4 3.	\$ 30	7.0	7-7			6-3	6		10 11	-5 7									7 791		31-4		
		90-1	19-	g. p	19-	20-1	No.	65-5	301	ii	4 8	3	dig i	23-4	84-7	20-3	31-7	18-0	19-5	18-5	12.4	11-9	12-9	7-3	1-0	1/0/1	19 1	HS 8	130	1 8.	7.3	1-6	3.6	1-3	6.4	10	5.6 3	1-8 11	9	S 181	0.34	18-3	313	15.0	15-5	5.7 1	-7 St	S 06.1	1964		III-3 3	
	200	93-4	1470	37-	100-0	#J-0	3417 565	11105	Box	9 11		2/10/2	M-6 1		Sept.	511	35.43	15-3	95-3	11-3	12.3	11 (6)	111/0	Total C	drik)	1-9 1		In I A	a pa.	3-	713	243	5-4	5-3	5-9	Fall)	F4 1	1-3   11		d: 164	5 5-6	145.5	19/10	15-4	15-6	8-0 1		T 31	110.8		13-1-2	10-9
	177	51.1	57-	0 30-	14-4	PD-0	34.4	40-9	\$15 R0-	7 11	1 3	14	47-8	811-E	81-7	20.3	30/3	17:0	17.5	14.	1119	ST-q-	11.35	7-	7-	7.6	1.6	12 3	6 7.	9 7-	101	2.8	5-3	5-9	5-7	1-5	5-6 ]	pa 11	18 7	1 100	6 6-7	111-0	11-0	101	15.1	F-3	53 57-	3 46	90-4	05-4	20-9 S	41

Also the measures of Miss\_

, taken

, 189 , by

#### WELLESLEY COLLEGE GYMNASIUM,

LUCILE EATON HILL, M. ANNA WOOD, Director, Examiner.

# ANTHROPOMETRIC TABLE.

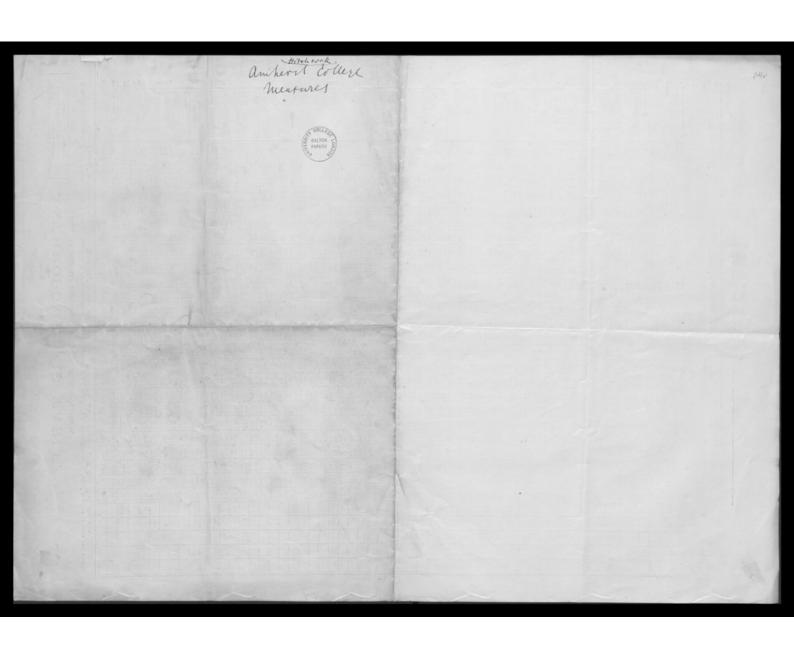
Compiled from the Measurements of 1100 Wellesley Students.

Arranged according to Bodily Heights. In each item the figures above represent millimetres and kilograms; the figures below inches and pounds. "Age" is given in years and months. "Lung Capacity" in litres and cubic inches. By "Pilosity" is meant the amount of the body covered by hair. Compiled by M. Anna Wood, May, 1890.

	-Lang	Capa	icary	1.0 41	res as		DEC 18	LARES.	Ly	2 1100	ny n	, men			ant of	FARE	rouy c	epere	u oy	warr.		mprin	a oy		N.N.O.	rr oou,	- sway,	royo			-
Hei	ght in m.m.	1480	1490	1300	1510	1520	1530	1540	1510	1560	1570	1580	1.590	1000	1610	1629	1650	1640	1650	1660	1629	1680	1600	1700	1710	1720		**	***	****	*****
Hei	ght in inches	58.3	38.7	59.1	29,5	59.8	60.2	60.6	61.	61.4	61.8	62.2	62.6	63.	65.4	63.8	64.2	64.6	65.	63.4	65.7	66.1	66.5	65.9	67.3	67.7					
		*****			18-4	19-5				19-10											24.0										
Ap		47.9	48.4	49.7	49.9	49.5	30.9	51.5	31,9	51.5	19-9	31.5	35.4	55.4	33.6	54.6	19-10	56.9	19-9	19-7 57.6	29-2	18-7	19.	39.1	59.2	21-1	-		-		
We	ght	790	207.5	797	110.8	110.8	110	815	113.5	115.5 822	115.5	829	837	118.6	845	835	123	196.5	127.4	128.	128.2	131. 870	181.8	873	151.5 875	132.5					
	Sitting	33.3	31.3	31.4	31.4	31.9	32.	32.	32.4	32.4	32.6	82.7	33.	53.5	33.3	33.7	34.1	34.1	34.1	34.1	34.2	34.5	24.3	34.4	34.4	34.4					
	Knee	379 14.9	15.1	385	387	390 15.4	394 15.5	15.5	396 15.6	401 15.7	15.7	40E 15.8	15.9	15.9	410 16.1	16.1	16.4	16.4	418 16.4	420 16.5	16.7	16.9	17.1	17.1	17.1	17.1					
-	Poles	27.8	712	29.2	731	733 78.8	734	29.1	746	738 20.6	763 50.	30.1	269 20.2	723 20.4	781 80.7	30.7	295	799 31,4	803	807	819	822 32.4	823 82.4	826 32.5	830	833 32.8					
6	Navel	581 34.6	884 54.8	892 55.1	905 53.6	300	920	924 36.4	36.6	949	945	37.4	958	965	967	974	990	293 39.1	998 39.3	999 39,3	1917 59.8	1004	1017	1029	1002	1033					
	0.00	1215	1220	1222	1223	1361	1932	1262	1265	1976	1284	1285	1289	1310	1516	1327	1334	1345	1550	1365	1576	1380	1549	1390	1206	1399					
	Stemon	542	544	344	48.2 346	346	348	549	330	550	330	550	330	51.6	351	59.8 551	30.6	52.9 555	133	55.7	333	557	334	54.7 558	140	363					
	Head	21.4 218	21.5	21.5	21,5	21.5	200	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.8	21.8 012	21.6	21.8	21.8	21.9	31.9	21.9	22. 314	22.1 316					
	Nock	710	11.8	11.7	794	11.9 724	11.0	11.9	11.9	12.	12. 234	12.	235	12.3	744	19.1 744	745	749	12.3	19.5	255	12.3	737	12.4 765	765	12.4					
	Chest	28.2	28.3	26.5	28.5	28.5	28.5	28.5	28.6	28.7	26.9	28.2	28.5	29.1	29.3	29.3	29.5	29.5	29.5	29.6	29.7	29.7	29.8	30.1	30.1	30.1					
	Chest Fell	20.3	774 30.5	30.5	280	792 20.8	783 30.8	785 30.8	31.	31.1	31.1	201.0	292 31.4	81.5	31.5	803	31.7	813	814 52.1	815	816	820	820 32.5	823 32.4	823 32.4	82.5					
	Nigh lith	560 22.	365 72.7	22.4	22.7	33.2	23.8	610	24.	610	24.2	614 24.2	21.2	613 24.2	24.7	24.2	617 94.5	24.5	24.5	24.3	617 24.5	24.8	617 26.5	617	617	21.3					
	Nieth Rib Full .	26.2	665 26.2	065	26.2	665 76.2	26.7	663 26.2	26.2	26.7	006 M.2	26.3	96.3	673	672	605	685	588 27.1	691 27.2	696 17.3	695 27.3	698 27.3	695 27.5	695	693 97.3	693 17.3					
		602 23.7	606 23.8	606 23.8	609	629	620 24.4	620 24.4	620	622	622	423	623	633	624 24.6	624	634 24.6	625	628	631	635	637	639	639	639	639					
	Waist	866	868	870	870	856	875	#25	876	91.5 976	876	24.5 926	876	876	878	24.6 A83	893	809	906	24.8	914	25.1	915	915	915	917					
	Hips	54.1	34.2	34.3	338	34.3	34.5 345	34.4	34.5	34.5	34.5	34.3	547	543	34.3	558	554	55.4	33.6	35.7	363	565	364	364	364	563			-	-	
	Thigh B.	21.2 534	21.2 554	33.2	587	31.3	21.5 545	345	21.5	343	21.6	346	21.6	346	91.7 346	21.7	21,8 554	21.9	72. 557	22. 560	22.1	22.1	39.2	22.2	363	27.2			-		
	Thigh L	21.1	21.1	23.2	21.2	21.5	21.5	21.5	21.5	345	21,5	31.5	21.5	346	21.5	21.8	33.8	21.9	21.9	356	22. 557	22.	357	22.1	32.1	22.2				-1	
	Koot R	13.2 334	13.2 334	354	10.2	13.2	15.4	343	13.6	13.6	344	345	13.6	347	347	13.7	11.8	14.	14.	14.	14.1	14.1	357	14.1	14.1	14.2					_
	Knee L	15.2	13,2	33.7	18.2	13.7	13.4	13.5	15.5	11.6	18.6	13.6	15.7	13.7	13.7	13.7	19.7	15.8	16.	14.	14.	14.	14.1	14.1	14.1	16.1					
	CalrR	12.6	12.8	13.1	13.1	13.1	13.2	13.3	387 13.5	387	337 13.3	557 15.5	339 13.4	13.4	13.4	339 15.4	13.4	339 15.4	13.4	339 15.4	13.4	339 15.4	13.4	15.4	15.4	15.4					
4	Calf L	12.6	12.8	330	330 13.	330 13.	13.	334 13.2	574 18.2	304 31.2	335 13.2	335	13.3	13.8	337	13.3	357 13.5	337	11.4	10.4	339	15.4	11.4	13.4	340 13.4	15.5					
1	Askle R	7.6	7.6	7.6	7,6	7.6	7.7	197	198 7.8	7.8	7.9	7.9	7.9	7.5	291 7.9	202 8.	202	202	205 5.1	8.1	200 8.1	230 8.3	210 8.3	8.3	211 8.3	212 8.4					
-	Ankle L	7.5	190 7.5	191	192	193 7.6	195 7.6	196	7.7	197	200 7.3	200 7.9	200 7.0	7.9	7.9	202	202 8.	202 K	204	205 8.1	205	200 8.3	210 8.3	211	211 8.3	2112 8.3					
	Instep R	206 5.1	206 8.1	206 8.1	907	208 8.2	200 8.5	210 8.5	230 6.5	210 8.5	230	211 8.3	212	215	218	215	214	915 8.5	216	216	217	215	219	220	220	222					
	Instep L	294 5.1	205 5.1	204 5.1	206	207	208 8.2	208	208 8.2	209	209	210 8.5	2112 8.4	212	212	212 8.4	215	213	214	234	215 8.5	228	218 8.6	219 8.7	220 8.7	221 8.7					
		257	257	257	207	257	207	263	264 10.4	264	264	264 10.4	264	264	264	264	264	264	264	265	265	267	268	270	271	273					
	Up. Arm H.	353 3.9	253	251	200	235	255	210	359	257	258	250	259	258	258	257	230	200	200	261	263	265	265	264	265	270					
	Up. Arm L	213	F13	214	21.5	217	232	219	221	221	771	10.2	221	228	225	723	10.2	206	217	202	228	229	230	230	231	231	-		-		
	Elbow R	218	8.4 213 8.4	234	214	216	236	817	818	218	216	9.7 250	220	220	920	229	221	223	223	223	725	9.1	250	200	200	201				-	
	Ellew L	8.4 206	200	8.5 T10	210	210	2100	8.6 210	211	8.6 211	911	913	8.7 215	8.7	215	8,7 215	8.7	214	216	8.8	219	222	223	253	9.1 223	9.1 223	-		-	-	-
	Fore Arm E	200	8.5	8.3	8.1	8.3 209	8.5 209	9.5	8.5 200	210	8.5	8.4 211	211	8.5	211	8.5	8.5	8.5 213	8.5 E14	8.5	8.7	8.8	8.8	8.8	8.8 239	8.8				4	_
	Fore Arm L	8.1	9.3	143	8.3	8.3	8.3	8.3	146	8.3	8.8	8.3	148	8.3	8.3	8.5	8.4	8.4	8.5	8,5	8.5	8.4	8.7	8.7	8.7	107					
	Wrist R	3.6	3.6	5.6	3.6	5.7	5.7	5.7	5.7	5.7	5.7	3.8	5.8	5.8	5.8	5.9	5.9	5.9	5.9	5.9	3.9	6.	6.	6.	6.1	6.2			-		
	Wrist L	5,5	141 5.5	5.5	3.6	143 5.6	3.6	144 5.7	3.7	345	5.7	146 5,7	146 5.7	3.7	5.8	3.8	3.6	5.8	130 5.9	5.9	5.9	3.31	5.9	6,	6.	6.1					
i i	Chest	160 6.5	6.3	160	6.3	6.3	6.3	163	6.4	163	163	164	164	6.5	164	6,5	165	165	163	6.6	168	6.6	168	6.6	6.7	6.7					
Day 1	Abdomes	7.1	185 7.5	188	188	188	188 7.4	188	189	200 7.5	210	204 8.1	205	296 8.1	205	900 8.1	206 8.1	206 8.1	206	906 8.1	218 8.4	215	216	217	2117	217					
	Head	144	144	144	164	144	146	146	165	146	146	146	144	146	147	147	147	147	148	148	148	148	148	148	148	150					
		93	33	93	98	- 53	93	5.7	93	93	95	55	95	95	93	5,8	3.8	57	97	28	3.8	5.8	100	100	3.8	5.9					
	Neck	341	343	3.6	352	3.6	3.6	334	354	8.7	855	3.7	3.7	361	3.7	3.7	3.7	3.8	3.8	3.8	266	3.9	349	3.5	370	872		-	-		-
To the same	Shoulders	13.4	208	208	209	211	214	214	714	14.	214	234	915	14.2	14.2	216	218	218	14.4 318	218	218	218	14.6 23.6	218	212	14.7					
â	Waist	505	9.7	8.2	8.8	308	8.5	201	8.5	255	8,5	313	8.5	314	8.5	8.5	8.6	8.4	8.6 220	8.6	8.6	8.6	8.6	8.6	8.7	8.7					-
	Пр	11.5	11.9	12.	12.	201	12.2	202	12.5	12.3	204	205	12.4	204	12.4	12.4 205	12.4	12.6	12.6	12.4	12.6	12.4	12.6		11.7	12.7					
	Nipples	7.7	2.7	160	8.1	7.9	7.9	8.	8.1	8.	8.1	8.1	8.1	8.1	6.1	8.1	906 8.1	208 8.2	208 8.2	8,3	8.3	8.4	5.4	8.4	8.4	8.5 8.5					
	Shoulder Elbow H	12.1	12.4	515 12-4	318 12.5	12.6	322 12.7	12.9	527 12.9	12.9	13.	330 15.	336 13.2	236 13.2	337	339 15.4	15.4	346 13.6	346 13.6	347	15.8	13.3	333 13.9		354	14.1					
	Shoulder Elbow L	19.1	12.4	315 12.4	12.5	11.6	320 12.6	326 12.8	12.9	327	530	330 13,	334 13.2	334	557 15.5	15.5	341 13:4	345 15.6	345	347	334 15.8	352 13.9	333	533	354	338 14.1					
-	Ellow Tip R	388 13.3	394 15.5	396 15.5	398	13.7	408 15.8	15.9	407 16.	16,1	614 16.3	415	420 16.5	421	421 16.5	16.6	16.8	429 16.9	483 17,	484 17.1	17.1	455	436 17.5	456	439 17.3	442 17.4					
-	Ellow Tip L	288 15.3	294 15.5	13.5	398 15.6	339 15.2	601 15.7	15.9	405 15.9	16.	412 16.2	414	420 16.5		421 16.5	422 16.6	427 16.8	429 16.9	455	454 17.1	433 17.1	685 17.1	436 17.1	436 17.1	439 17,3	840 17.3					
2	Foot R	218 8.6	222	223	724	225 8.3	926 8.9	226 8.9	227	228	255	235 9.2	235 9.2	236	236 9.3	937	297	258	241	242	943 9.5	243	243	947	\$17 9.9	252					
	Foot L.	215 8.5	120 8.7	223	224	225	225	226	227	118	229	230)	251	233	334	234	9.3	207	240	212	243	243	243	217	231	255					
	Description of the second	1439.	11105	1521.	ESSS.	1241.						9.1		9.2				9.3				9,5				1735					-
	Stretch of Arms	59,	39.5	50.8	100	60.6	60.7	61.8	61.8	53	56	55.4	55.6	100	10	50	64.6	65	65.2	63.5	61	66.6	62	68.1	68.1	63		-	-		-
	Back	120	77	110.2	801	80.1	112.4	116.8	116.8	116.8	123.5	123.5	123.5	127.9	150.1	130.3	150.1	100.1	152.5	114.5	134.5	100	105	110	120						
É	Legs	158.7	154.2	25	187.4	187.4	189.6	189.6						200.4			216.1				218.3										
81	Chest	48.5	50.7	50.7	52.9	52.9	55.1	55.1	55.1	55.1	55.1	20.1	57.5		57.3	57.5	57.3	57.3	57.8	37.3	57.5	57.3	37.3		59.5	39.5					
ě.	Fore Arm R	90 44,1	44.1	48.5	48.5	30.7	50.7	52.9	52.9	32.3	24 52.9	24 32.9	24 52.9	25 26.1	35	25 55.1	53.1	23 35.1	57.3	37.3	26 57.3	36 57.5	26 37.5	57.3	26 57.5	37.3					
	Fore Arm L	46.3	41.9	66.3		46.3	21 46.5	46.5	21 46.5	46.3			95.5		21 46.3	21 46.5	22 48.5	21 46.3	50.7		48.5	20 44.1	46.3		48.5	50.7					
Lun	g Capacity	2.24 337	2.29 140	2.57 145	2,39 146	2.39 146	2.42 148	2.44	2.44 149	2.44	2.45 150	2.45 150	2.45 150	2.45 150	2.49 152	138	2.49 152	2.55	2.65 162	2.70 163	2,20	2.75	3.68	3.08 188	3.08	3.13 191					
	ity.	1.7	1.8	2.2	2.2	2.8	2.4	2.5	2.	2.1	2.2				2.	1.6	1.6	1.9		2.2		1.6	1.5	2.2	1.9	2.					
-											-							-	-	-		2181									-1
*4	to the measures of A	Visa									taken	-			*		18		by												

*Also the measures of Miss	, taken	*	_18 , by	
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# A STUDY

# ANTHROPOMETRY

RELATING TO

PHYSICAL GROWTH IN A LIMITED TIME.



## PHYSICAL GROWTH OF AMHERST STUDENTS.

The rate of growth, increase, or development of the physical and intellectual powers of the human being, is an interesting study in authropology. At Amherst College there is a favorable opportunity for a portion of this study by comparing physical measurements of Freshman and Senior classes. There is offered to this program of the 13th Ladd Prise Exhibition of In-door Sports a comparison of the Freshman statistics of the last eleven years with those of the Senior year. The average age of the Freshman year has been 19 years, and of the Senior year three years and five months additional. The table on the next page shows the average of each item during the two years studied, the per cent, of increase in each item, and the grouping together of the items under, Bone Structure, Muscular Size, Vital Organs, Weight and Muscular Power. Under this grouping we find the items of the SMALLEST GAINS to be

Right and Left Girth of Foot, Height of Body, 0.64 "Right and Left Elbow Tip, Right and Left Shoulder Elbow, 0.81 "Height of Pubes, 0.82 "

Also the LARGEST GAINS seem to be

The Dip, 56.67 p. c.
Total Strength, 25.13 "
Strength of Lungs, 24.25 "
Strength of Legs, 24.17 "
Pull Up, 22.27 "
Strength of Forearms, 15.46 "

By arranging all the items in groups representing essentially structure and function, we find an increase in

Bone Structure, of 1.31 p. c.

Muscular Size, of 4.47 "

Vital Organs, of 4.51 "

Bodily Weight, of 7.42 "

Muscular Power, of 24.90 "

From this little study in Anthropology we seem to help establish the fact, that in

From this little study in Anthropology we seem to help establish the fact, that in college students between nineteen and twenty-two years of age the essential development of the body and its powers is not along the line of structure and material growth, but principally in function. The framework and bulky tissues exhibit but a very small per cent. of growth, and the muscular and vital organs show a smaller per cent. of increase than does the total weight of the body, and even the external dimensions of the head give but one per cent. of growth, whereas the different tests of physical strength give almost a twenty-five per cent. increase during the college course.

strength give almost a twenty-five per cent. increase during the college course. It is a very significant fact that the highest increase of all the "Gains" is to be found in the Dip, which is the severest of the Strength Tests. The probable explanation of this is that the required daily exercise in the Dumb Bell Drill, which tends directly to the increase of chest, back and arm muscles, determines the character of the Dip and Pull Up. And the Physiological principle and Hygienic fact to be found here, is, that moderate, persistent and regular muscular use, determines a higher force value, than a shorter, more energetic and closely circumscribed muscular training for the Ambrage Man in the Long run. For the well marked athletic man, save perhaps the specialist who pitches the ball—does not give the highest records in the Dip and Pull Up.

#### Anthropometric Records of Amherst Gllege.

Per cent, of gain between Freshman and Senior years

WEIGHT,	GROUPS OF STRUCTURE AND FUNCTION
** Sternum, 1408 141872 ** Navel, 1030 103988 ** Pubes, 86282 ** Expenses, 86282 ** Knee, 474 47764 ** Sitting, 893909 180 ** GHRTH, Head, 567 57289 ** Neck, 355359 113 ** Chest repose, 866903 428 ** Chest repose, 866903 428 ** Chest fell, 919 947 305 ** Belly, 723 753 416 ** Belly, 723 753 416 ** Hips, 883 908 244 ** Right Thigh, 500 523 400 ** Right Knee, 357 3.63 170 ** Left Thigh, 500 523 400 ** Right Knee, 356 336 ** Left Calf, 342 334 ** Left Calf, 341 352 333 ** Right Instep, 243 246 166 ** Upper Right Arm, 253 267 554 ** Upper Left Arm, 246 262 661 ** U. R. A. Contract'd, 287 315 977 ** Right Elbow, 247 255 325 ** Left Elbow, 247 255 325 ** Right Forearm, 258 265 272 ** Left Elbow, 107 111 374 ** Left Wrist, 165 167 122 ** Left Wrist, 164 165 161 ** Neck, 107 111 374 ** Nipples, 193 204 570 ** Right Wrist, 164 165 167 122 ** Left Elbow, 370 373 882 ** Right Shoulder Elbow, 372 375 8.1 ** Left Shoulder Elbow, 372 375 8.1 ** Left Shoulder Elbow, 372 375 8.1 ** Left Foot, 260 261 39 ** Left Elbow Tip, 461 464 6.66	Weight.
**Navel**, 1030 1039 .88  **Pubes**, 862 863 .82  **Knee**, 474 477 .64  **Sitting**, 893 909 1.80  **GIRTH, Head, 567 572 .89  **Neek**, 355 359 1.13  **Chest repose**, 866 903 4.28  **Chest full**, 919 947 3.05  **Chest full**, 923 753 4.16  **Hips**, 883 908 2.84  **Right Thigh, 507 527 3.95  **Left Thigh, 500 523 4.00  **Right Knee**, 357 363 1.70  **Left Knee**, 356 363 1.97  **Left Knee**, 356 363 1.97  **Right Calf**, 341 352 3.23  **Right Laft**, 342 354 3.51  **Left Calf**, 341 352 3.23  **Right Instep**, 243 247 1.65  **Left Instep**, 243 247 1.65  **Left Upper Right Arm**, 246 262 6.51  **Upper Left Arm**, 246 262 6.51  **U. R. A. Contract'd, 287 315 9.77  **Right Elbow**, 243 250 2.89  **Right Forearm**, 253 266 2.72  **Left Elbo**, 243 255 3.25  **Left Florearm**, 253 266 2.72  **Right Forearm**, 253 266 2.72  **Right Forearm**, 253 266 2.77  **Right Forearm**, 253 266 3.3  **Right Forearm**, 253 260 2.77  **Right Wrist**, 165 167 1.22  **Left Wrist**, 164 165 6.61  **Shoulders**, 193 204 5.70  **Neek**, 107 111 3.74  **Shoulders**, 193 204 5.70  **Nipples**, 193 204 5.70  **Waist**, 249 288 3.62  **Hips**, 323 336  **Authorized Flow**, 372 375  **Shoulders**, 184  **Shoulder Elbow**, 372 375  **Shoulders**, 184  **Shoulder Elbow**, 372 375  **Shoulders**, 1849 485  **Shoulders	Bone,
Pubes, 862 869 82  Rec, 474 477 .64  Sitting, 893 909 1.80  GHRTH, Head, 567 572 .89  Neck, 355 359 1.13  Chest repose, 866 903 4.28  Chest full, 919 947 3.05  Hips, 883 908 2.84  Right Thigh, 500 523 4.60  Right Knee, 357 363 1.70  Left Thigh, 500 523 4.60  Right Knee, 357 363 1.70  Left Calf, 342 354 3.51  Left Calf, 341 352 3.23  Right Instep, 243 247 1.65  Left Instep, 243 247 1.65  Left Instep, 243 247 1.65  Left Elbow, 243 250 2.89  Right Elbow, 247 255 3.25  Left Elbow, 243 250 2.89  Right Forearm, 258 255 2.72  Right Wrist, 164 165 167 1.22  Right Wrist, 165 167 1.22  Right Wrist, 165 167 1.22  Right Wrist, 164 165 6.61  RECAL Wrist, 164 165 6.61  RECAL Wrist, 165 167 1.22  Right Wrist, 164 165 6.61  RECAL Wrist, 165 167 1.22  Right Wrist, 165 167 1.22  Right Wrist, 164 165 6.61  RECAL Wrist, 165 167 1.22  RECAL Wrist, 164 165 6.61  RECAL Wrist, 165 167 1.22  RECAL Wrist, 164 165 6.61  RECAL Wrist, 165 167 1.22  RECAL Wrist, 164 165 167 1.22  RECAL Wrist, 165 167 1.22  R	Bone.
Kanee,   474   477   .64	
Sitting, 893 909 1.80 GIRTII, Hend, 567 572 89  Neek, 355 359 1.13 Chest repose, 866 903 4.28 Chest repose, 866 903 4.28 Chest full, 919 947 3.05 Hips, 883 908 2.84 Right Thigh, 507 527 3.95 Left Thigh, 500 523 4.60 Right Thigh, 500 523 4.60 Right Thigh, 301 523 4.60 Right Knee, 357 363 1.70 Left Calf, 342 354 3.51 Left Left Instep, 243 247 1.65 Left Instep, 243 247 1.65 Left Instep, 243 246 1.66 Upper Right Arm, 253 267 5.34 Upper Left Arm, 246 262 6.51 U. R. A. Contract'd, 287 315 9.77 Right Elbow, 247 255 3.25 Left Elbow, 247 255 3.25 Left Elbow, 248 250 2.89 Right Forearm, 258 265 2.72 Right Wrist, 164 165 167 1.22 Left Forestm, 258 265 2.77 Right Wrist, 164 165 167 1.22 Left Wrist, 164 165 167 1.22 Left Wrist, 165 167 1.22 Left Wrist, 164 165 167 1.22 Left Wrist, 164 165 167 1.22 Left Mrist, 164 165 167 1.22 Left Shoulders, 426 443 4.47 Nipples, 193 204 5.70 Waist, 249 258 3.62 Hips, 323 336 4.03 Right Shoulder Elbow, 370 373 82 Right Elbow Tip, 461 464 66 Left Elbow Tip, 461 464 66	Bone.
GIRTH Hend, 567 572 .89  Neck, 355 359 1.113  Chest repose, 866 903 4.28  Chest repose, 866 903 4.28  Chest full, 919 947 3.05  Belly, 723 753 4.16  Hips, 883 908 2.84  Right Thigh, 500 527 3.95  Left Thigh, 500 523 4.60  Right Knee, 357 363 1.70  Left Knee, 356 363 1.97  Right Calf, 342 354 3.51  Left Calf, 341 352 3.23  Right Instep, 243 247 1.65  Left Instep, 242 246 1.66  Upper Right Arm, 253 267 5.54  Upper Right Arm, 253 267 5.54  Left Elbow, 247 255 3.25  Right Elbow, 247 255 3.25  Right Forearm, 288 265 2.72  Right Wrist, 165 167 1.22  Left Elbow, 107 111 3.74  Neck, 107 111 3.74  Shoulders, 426 445 4.47  Nipples, 193 204 5.70  Waist, 249 258 3.62  Waist, 249 258 3.62  Hips, 323 356 4.03  Right Elbow, 370 373 881  Left Elbow, 370 373 881  Left Shoulder Elbow, 370 373 8.22  Right Elbow Tip, 461 464 66  Left Foot, 260 261 39  FIRENCY PARMS, 1782 1794 6.88  RORIZONTAL LENGTH, 1731 1749 1.04  FIRENCY PARMS, 1782 1794 6.88  RORIZONTAL LENGTH, 1731 1749 1.04  FIRENCY PAIL STORM, 138 155 1.51  R. Forearm, 58.5 4 5.4 17,93  L. Forearm, 58.5 4 5.6 67  Pull, 58.67 10.60 22.27	Bone.
Neek,   355   359   1.13	Bone.
Chest repose, 866 903 4.28  Chest full, 919 947 3.05  Belly, 723 753 4.16  Hips, 883 908 2.84  Right Thigh, 507 527 3.95  Left Thigh, 500 523 4.00  Right Knee, 357 363 1.70  Left Knee, 356 363 1.97  Right Calf, 342 354 3.51  Left Calf, 342 354 3.51  Left Left Left, 342 354 3.51  Left Calf, 342 354 3.51  Left Calf, 342 354 3.51  Left Left Instep, 243 247 1.65  Left Instep, 243 247 5.54  Left Instep, 243 250 5.34  Upper Right Arm, 253 267 5.54  Upper Right Arm, 253 267 5.34  Right Elbow, 247 255 3.25  Left Elbow, 243 250 2.89  Right Forearm, 258 265 2.77  Right Wrist, 165 167 1.22  Keft Wrist, 165 167 1.22  Walst, 249 258 3.62  Kight Elbow, 370 373 8.22  Right Shoulder Elbow, 370 373 8.22  Right Shoulder Elbow, 372 375 8.1  Left Forearm, 461 464 66  Left Elbow Tip, 461 464 66  Left Elbow Tip, 461 464 66  Left Foot, 260 261 39  LETETICH OF ARMS, 1782 1794 6.8  RORIZONTAL LENGTH, 1731 1749 1.04  STRENGH Of Lungs, 132 1.64 24.25  REFERENG H, Right Foot, 261 262 39  TRENGH OF ARMS, 1782 1794 6.8  RORIZONTAL LENGTH, 1731 1749 1.04  STRENGH Of Lungs, 132 1.64 24.25  R. Forearm, 28.5 45.4 17.93  L. Forearm, 25.4 40.0 13.00  Dip, 5.33 8.35 56.67  Pull, 867 10.60 22.27  Pull, 867 10.60 22.27	Bone.
**Chest full,	Muscles.
Helly, 723 753 4.16  Hips, 883 908 2.24  Right Thigh, 507 527 3.95  Left Thigh, 500 523 4.60  Right Knee, 356 363 1.97  Left Knee, 356 363 1.97  Right Calf, 341 352 3.23  Right Left Laft, 341 352 3.23  Right Left Laft, 341 352 3.23  Right Instep, 242 246 1.66  Upper Right Arm, 253 267 5.54  Upper Right Arm, 253 267 5.54  Upper Left Arm, 253 267 5.54  Right Elbow, 243 247 2.55  Right Elbow, 247 2.55  Right Elbow, 243 250 2.89  Right Forearm, 258 265 2.72  Left Forearm, 258 265 2.72  Left Wrist, 164 165 6.1  BREADTH, Head, 153 155 1.31  Neek, 107 111 3.74  Shoulders, 426 445 4.47  Nipples, 193 204 5.70  Nipples, 193 204 5.70  Waist, 249 288 3.62  Hips, 323 336 4.03  Right Elbow, 370 375 82  Right Elbow, 243 250 2.89  Right Wrist, 164 165 6.1  READTH, Head, 153 155 1.31  Neek, 107 111 3.74  Shoulders, 426 445 4.47  Nipples, 193 204 5.70  Waist, 249 288 3.62  Hips, 323 336 4.03  Right Shoulder Elbow, 372 375 8.1  Left Shoulder Elbow, 372 375 8.1  Left Shoulder Elbow, 260 261 3.9  RENGTH, Right Foot, 261 262 3.9  RENGTH, Right Foot, 261 262 3.9  FRETCH OF ARMS, 1782 1794 6.8  HORIZONTAL LENGTH, 1731 1749 1.04  STRENGH of Langs, 1.32 1.64 24.25  Reck HORIZONTAL LENGTH, 1731 1749 1.04  STRENGH of Langs, 1.32 1.64 24.25  Reck HORIZONTAL LENGTH, 1731 1749 1.04  STRENGH of Langs, 1.32 1.64 24.25  Reck Horizontal Length, 133 154 15.80  Reck 133 154 15.80	Vital Organs.
Hips, 883 908 2.84  Right Thigh, 500 527 3.95  Left Thigh, 500 523 4.60  Right Knee, 357 363 1.70  Left Knee, 356 363 1.70  Left Knee, 356 363 1.97  Right Instep, 243 354 3.51  Left Calf, 342 354 3.51  Left Calf, 342 354 3.51  Left Calf, 342 354 3.51  Left Laft, 342 354 3.51  Left Laft, 342 354 3.51  Left Laft, 342 354 3.51  Left Instep, 243 247 1.65  Left Instep, 243 246 6.66  Upper Right Arm, 253 266 5.54  Upper Left Arm, 246 262 6.51  U. R. A. Contractd, 287 315 9.77  Right Elbow, 247 255 3.25  Left Elbow, 243 250 2.89  Right Forearm, 258 265 2.72  Right Wrist, 165 167 1.22  Right Wrist, 165 167 1.22  Right Wrist, 165 167 1.22  Right Wrist, 164 165 6.61  BREADTH, Head, 153 155 1.31  Neck, 107 111 3.74  Neck, 107 111 3.74  Neck, 107 111 3.74  Waist, 249 258 3.62  Waist, 249 258 3.62  Hips, 323 336 4.03  Right Shoulder Elbow, 370 373 82  Right Shoulder Elbow, 372 375 81  Left Shoulder Elbow, 370 373 82  Right Shoulder Elbow, 370 373 83  Right Shoulder Elbow, 370 373 83  Right Shoulder Elbow, 370 373 83  Right Shoulder Elbow, 370 373 84  Right Shoulder Elbow, 370 373 84  Right Shoulder Elbow, 370 373 84  Right Shou	Vital Organs.
Right Thigh,   507   527   3.95	Vital Ofgans.
Left Thigh,   500   523   4.60	Bone.
Right Knee. 357 363 1.70  Left Knee. 356 363 1.97  Right Calf. 342 354 3.51  Left Calf. 341 352 3.23  Right Instep. 243 247 1.65  Left Instep. 242 246 1.66  Upper Right Arm. 253 267 5.54  Upper Left Arm. 264 262 6.51  Upper Left Arm. 246 262 6.51  Left Elbow. 247 255 3.25  Right Forearm. 258 265 2.72  Right Forearm. 258 265 2.72  Right Forearm. 258 265 3.27  Right Left Wrist. 165 167 1.22  Left Wrist. 165 167 1.22  Right Shoulder Libow. 107 111 3.74  Neck. 107 111 3.74  Neck. 107 111 3.74  Neck. 107 111 3.74  Shoulders. 426 445 4.47  Nipples. 193 204 5.70  Waist. 249 288 3.62  Hips. 323 336 4.03  Right Shoulder Elbow, 370 373 881  Left Shoulder Elbow, 370 373 881  Left Shoulder Elbow, 370 373 881  Left Shoulder Elbow. 370 373 882  Right Elbow Tip. 461 464 .66  Left Elbow Tip. 461 464 .66  Left Elbow Tip. 459 463 .88  LENGTH, Right Foot. 261 262 39  FIRETCH OF ARMS. 1782 1794 .88  HORIZONTAL LENGTH, 1731 1749 1.04  STRENGH of Lungs, 1.32 1.64 24.25  Legs. 149 185 24.17  R. Forearm, 78.5.4 40.0 13.00  Dip. 5.33 8.35 5.66,67  Pull, 867 10.60 22.27  Pull, 867 10.60 22.27	Muscles.
Left Knee, 356 363 1.97 Right Calf, 342 354 3.51 Left Calf, 341 352 3.23 Right Instep, 243 247 1.65 Left Unstep, 243 247 1.65 Left Instep, 242 246 1.66 Upper Right Arm, 253 267 5.54 Upper Left Arm, 246 262 6.51 Left Elbow, 243 250 2.89 Right Elbow, 243 250 2.89 Right Elbow, 243 250 2.89 Right Forearm, 258 265 2.72 Left Forearm, 258 265 2.72 Left Wrist, 165 167 1.22 Left Wrist, 164 165 6.1 BREADTH, Head, 153 155 1.31 Neek, 107 111 3.74 Shoulders, 426 445 4.47 Nipples, 193 204 5.70 Waist, 249 288 3.62 Hips, 323 336 4.03 Hips, 323 336 4.03 Hips, 323 336 4.03 Hips, 461 464 66 Left Bolowler Elbow, 370 373 82 High Elbow Tip, 461 464 66 Left Shoulder Elbow, 370 373 82 Right Elbow Tip, 461 464 66 Left Elbow Tip, 461 464 66 Left Foot, 260 261 .39 EnGTJH, Right Foot, 261 262 .39 Left Foot, 260 261 .39 EnGTJH, Right Foot, 261 262 .39 Left Foot, 260 261 .39 Left Foot, 270 260 261 .39 Left Foot, 271 1731 1749 1.04 Lege, 149 185 24.17 Leger, 149 185 24.17 Right Forearm, 35.4 40.0 13.00 Dip, 5.33 8.35 56.67 Pull, 867 10.60 22.27	Muscles.
Right Calf,   342   354   3.51	Bone.
Left Calf, Right Instep, 243 246 Left Instep, 242 246 1.65 Left Instep, 242 246 Upper Right Arm, 253 267 5.54 Upper Left Arm, 246 262 267 315 277 Right Elbow, 247 255 255 277 Right Elbow, 243 250 289 Right Forearm, 258 265 2.72 Right Forearm, 258 265 2.72 Left Wrist, 165 167 1.22 Left Wrist, 165 167 1.22 Left Wrist, 164 165 61 181 Neck, 107 111 3.74 Neck, 107 111 3.74 Nopples, 193 204 5.70 Waist, 249 288 336 445 Whipples, 323 336 4.03 Right Shoulder Elbow, 370 375 81 Left Shoulder Elbow, 370 375 81 Left Shoulder Elbow, 370 375 81 Left Elbow Tip, 461 464 66 Left Elbow Tip, 461 464 465 Left Footd, 260 261 39 39 1782 1794 88 Legts, 1782 1794 189	Bone.
Right Instep,   243   247   1.65	Muscles.
Left Instep.   242   246   1.66	Muscles.
"Upper Right Arm, 253 267 5.54 "Upper Right Arm, 246 262 6.51 "U. R. A. Contract'd, 287 315 9.77 "Right Elbow, 243 255 3.25 "Left Elbow, 243 255 2.72 "Left Forearm, 258 265 2.72 "Right Wrist, 165 167 1.22 "Right Wrist, 165 167 1.22 "Right Wrist, 164 165 6.1 "Right Wrist, 153 155 1.31 "Neek, 107 111 3.74 "Neek, 107 111 3.74 "Nipples, 193 204 5.70 "Waist, 249 258 3.62 "Waist, 249 258 3.62 "Hips, 323 336 4.03 Right Shoulder Elbow, 372 338 Right Shoulder Elbow, 375 81 Left Shoulder Elbow, 370 373 82 Right Elbow Tip, 461 464 66 Left Elbow Tip, 459 463 88 LENGTH, Right Foot, 261 262 39 "Left Foot, 261 39 "Left Foot, 261 368 "Right Elbow Tip, 461 464 66 "Left Elbow Tip, 469 463 488 "Left Right Foot, 261 262 39 "Left Foot, 261 262 39 "Left Foot, 261 368 "Right Elbow Tip, 461 464 58 "Right Elbow Tip, 469 463 488 "Left Foot, 261 262 39 "Left Foot, 261 262 39 "Back, 133 154 15.80 "Reforearm, 183 154 15.80 "Reforearm, 183 154 15.80 "Reforearm, 185 44.17 "R. Forearm, 185 44.00 13.00 "Pull, 186,67 10,60 22.27	Bone.
" Upper Left Arm, " U. R. A. Contract'd, " Right Elbow, " 247 255 3.25 " Left Elbow, " 243 250 2.89 " Left Elbow, " 243 250 2.89 " Left Forearm, " 258 265 2.72 " Left Wrist, " 165 167 1.22 " Left Wrist,  164 165 .61 BREADTH, Head, " Neek, " 107 111 3.74 " Nipples, " 193 204 5.70 " Waist, " Nipples, " 193 204 5.70 " Waist, " Nipples, " 323 336 4.03 " Waist, " 249 258 3.62 " Hips, " 323 336 4.03 Right Shoulder Elbow, " 370 373 881 Left Shoulder Elbow, " 370 373 882 Right Shoulder Elbow, " 372 375 81 Left Elbow Tip, Left Hoot, " 1461 464 66 Left Elbow Tip, Left Hoot, " 147 461 464 66 Left Elbow Tip, Left Elbow, " 148 146 46 Left Elbow, " 148 146 166 Left Elbow, " 149 185 24.17 " 149 185 24.1	Bone.
Upper Left Arm.         246         262         6.51            U. R. A. Contract'd.         287         315         9.77            Right Elbow.         247         255         3.25            Left Elbow.         243         250         2.89            Right Forearm.         253         260         2.77            Left Forearm.         253         260         2.77            Right Wrist.         165         167         1.22            Left Wrist.         164         165         .61            Left Wrist.         164         165         .61            Left Wrist.         164         165         .61         .122            Neck.         107         111         3.74         .47            Shoulders.         426         443         4.47         .47            Shoulders.         293         304         5.70         .32         .36         .62         .44         .44         .44         .44         .44         .44         .44         .44         .44	Muscles.
Right Elbow. 247 255 3.25 Left Elbow. 243 250 2.89 Right Forearm. 258 265 2.72 Left Forearm. 258 260 2.77 Right Wrist. 165 167 1.22 Left Wrist. 165 167 1.22 Left Wrist. 164 165 .61 Right Wrist. 165 167 1.22 Right Wrist. 164 165 .61 Neck. 107 111 3.74 Neck. 107 111 3.74 Nipples. 193 204 5.70 Waist. 249 258 3.62 Hips. 323 336 4.03 Hips. 323 336 4.03 Right Shoulder Elbow. 372 375 .81 Right Shoulder Elbow. 370 373 82 Right Shoulder Elbow. 370 373 82 Right Elbow Tip. 461 464 .66 Left Floot. 261 262 .39 Left Foot. 260 261 .39 Left Foot. 1731 1749 1.04 STRENGH Of Lungs. 1.32 1.64 24.25 Legs. 149 185 24.17 R. Forearm. 28.5 45.4 40.0 13.00 Dip. 5.33 8.35 56.67 Pull. 867 10.60 22.27	Muscles.
Right Elbow. 247 255 3.25 Left Elbow. 243 250 2.89 Right Forearm. 258 260 2.72 Left Forearm. 258 260 2.77 Right Wrist. 165 167 1.22 Left Wrist. 164 165 6.1 Neck. 107 111 3.74 Neck. 107 111 3.74 Nopples. 193 204 5.70 Waist. 249 258 3.62 Hips. 323 336 4.03 Hips. 323 336 4.03 Hips. 323 336 4.03 Right Shoulder Elbow. 372 375 82 Right Shoulder Elbow. 370 373 82 Right Elbow Tip. 461 464 66 Left Floot. 260 261 39 Left Foot. 1731 1749 1.04 STRENGH of Lungs. 1.32 Legs. 1.33 154 15.80 Legs. 149 185 24.17 R. Forearm. 185.4 40.0 13.00 Dip. 5.33 8.35 56.67 Pull, 186, 77 10.60 22.27	Museles.
Left Elbow, 243 250 2.89 Right Forearm, 253 260 2.72 Left Forearm, 253 260 2.77 Right Wrist, 165 167 1.22 Left Wrist, 165 167 1.22 Left Wrist, 164 165 6.61 Neek, 107 111 3.74 Neek, 107 111 3.74 Neek, 107 112 3.74 Nipples, 193 204 5.70 Waist, 249 258 3.62 Hips, 323 336 4.03 Waist, 249 258 3.62 Hips, 323 336 4.03 Right Shoulder Elbow, 372 375 81 Left Shoulder Elbow, 370 373 82 Right Elbow Tip, 461 464 66 Left Foot, 260 261 39 Left Foot, 270 261 262 39 Left Foot, 270 261 30 Left Foot, 270 261	Bone,
Right Forearm,   258   265   2.72	Bone,
" Left Forearm, 253 260 2.77 " Right Wrist, 165 167 1.22 " Left Wrist, 164 165 .61 BREADTH, Head, 153 155 1.31 " Neek, 107 111 3.74 " Shoulders, 426 445 4.47 " Nipples, 193 204 5.70 " Waist, 249 258 3.62 " Hips, 323 336 4.03 Right Shoulder Elbow, 372 375 .81 Left Shoulder Elbow, 370 373 .82 Right Elbow Tip, 461 464 .66 Left Elbow Tip, 461 464 .66 Left Elbow Tip, 461 464 .66 Left Elbow Tip, 469 463 .88 LENGTH, Right Foot, 261 262 .39 " Left Foot, 260 261 .39 **STRETCH OF ARMS, 1782 1794 .68 **HORIZONTAL LENGTH, 1731 1749 1.04 **STRENGH of Lungs, **1.32 1.64 24.25 " Back, **133 154 15.80 " Legs, **133 154 15.80 " Legs, **133 154 15.80 " R. Forearm, **35.4 40.0 13.00 " Dip, **5.33 8.35 56.67 " Pull, **8.67 10.60 22.27	Museles,
"Right Wrist, 165 167 1.22 "Left Wrist, 164 165 61 BBEADTH, Head, 153 155 1.31 "Neck, 107 111 3.74 "Neck, 107 111 3.74 "Shoulders, 426 445 4.47 "Nipples, 193 204 5.70 "Waist, 249 288 3.62 "Hips, 323 336 4.03 Right Shoulder Elbow, 372 375 81 Left Shoulder Elbow, 370 373 82 Right Elbow Tip, 461 464 .66 Left Elbow Tip, 465 463 88 LENGTH, Right Foot, 260 261 39 "Left Food, 260 261 39 "TRETCH OF ARMS, 1782 1794 .88 HORIZONTAL LENGTH, 1731 1749 1.04 STRENGH of Lungs, 1.32 1.64 24.25 "Back, 133 154 15.80 "Legs, 149 185 24.17 "R. Forearm, 28.5 45.4 10.90 "Dip, 5.33 8.35 56.67 "Pull, 8667	Muscles,
" Left Wrist, 164 165 61 188 18EADTH, Head, 153 135 1.51 1.51 1.51 1.51 1.51 1.51 1	Bone,
BREADTH, Head, 153 155 1.31  "Neek, 107 111 3.74  "Shoulders, 426 445 4.47  "Nipples, 193 204 5.70  "Waist, 249 258 3.62  "Hips, 323 336 4.03  Right Shoulder Elbow, 372 375 81  Left Shoulder Elbow, 370 373 82  Right Elbow Tip, 461 464 66  Left Elbow Tip, 459 463 88  LENGTH, Right Foot, 261 262 39  LET FOOt, 200 261 39  STRETCH OF ARMS, 1782 1794 6.8  HORIZONTAL LENGTH, 1731 1749 1.04  STRENGH of Lungs, 132 1.64 24.25  "Back, 133 154 15.80  "Legs, 149 185 24.17  "R. Forearm, 28.5 45.4 17.93  "L. Forearm, 28.5 45.4 17.93  "Dip, 5.33 8.35 56.67  "Pull, 867 10.60 22.27	Bone,
" Neck, 107 111 3.74 " Shoulders, 426 445 4.47 " Nipples, 193 204 5.70 " Waist, 249 258 3.62 " Hips, 323 336 4.03 Right Shoulder Elbow, 372 375 81 Left Shoulder Elbow, 370 373 82 Right Shoulder Elbow, 450 464 66 Left Elbow Tip, 461 464 66 Left Elbow Tip, 461 262 .39 LENGTH, Right Foot, 261 262 .39 " Left Foot, 260 261 .39 STRETCH OF ARMS, 1782 1794 .68 HORIZONTAL LENGTH, 1731 1749 1.04 STREEGH of Lungs, 1.32 1.64 24.25 " Back, 133 154 15.80 " Legs, 149 185 24.17 " R. Forearm, 28.5 4 40.0 13.00 Dip, 5.33 8.35 56.67 " Pull, 86,67 10.60 22.27	Bone,
"Shoulders, 426 445 4.47 "Nipples, 193 204 5.70 "Waist, 249 288 8.62 "Hips, 323 336 4.03 Right Shoulder Elbow, 372 375 81 Left Shoulder Elbow, 370 373 82 Right Elbow Tip, 461 464 66 Left Elbow Tip, 461 262 39 LENGTH, Right Foot, 261 262 39 LENGTH, Right Foot, 260 261 39 TRETCH OF ARMS, 1782 1794 68 HORIZONTAL LENGTH, 1731 1749 1.04 STRENGH of Lungs, *1.32 1.64 24.25 "Back, *133 154 15.80 "Legs, *133 154 15.80 "Legs, *134 185 24.17 "R. Forearm, *28.5 45.4 40.0 13.00 Dip, *5.33 8.35 56.67 "Pull, *8.67 10.60 22.27	Museles.
"Nipples, 193 204 5.70 "Waist, 249 288 3.62 "Hips, 323 336 4.03 Sight Shoulder Elbow, 372 375 8.1 Left Shoulder Elbow, 370 373 8.82 Right Elbow Tip, 461 464 .66 Left Elbow Tip, 469 463 .88 Left Elbow Tip, 260 261 .39 "Left Foot, 260 261 .39 STRETCH OF ARMS, 1782 1794 .88 HORIZONTAL LENGTH, 1731 1749 1.04 STRENGH of Langs, 1.32 1.64 24.25 "Back, 133 154 15.80 "Legs, 149 185 24.17 "R. Forearm, 58.5 45.4 17.93 "L. Forearm, 53.4 40.0 13.00 "Dip, 5.33 8.35 56.67 "Pull, 867 10.60 22.27	
"Waist, 249 258 3.62 "Hips, 323 336 4.03 Right Shoulder Elbow, 372 375 81 Left Shoulder Elbow, 370 373 82 Right Elbow Tip, 461 464 66 Left Elbow Tip, 469 463 88 LENGTH, Right Foot, 261 262 .39 LENGTH, Right Foot, 261 262 .39 "Left Foot, 1782 1794 68 STRETCH OF ARMS, 1782 1794 68 HORIZONTAL LENGTH, 1731 1749 1.04 STRENGH of Lungs, 1.32 1.64 24.25 "Back, 133 154 15.80 "Legs, 149 185 24.17 "R. Forearm, 28.5 45.4 17.93 "L. Forearm, 25.4 40.0 13.00 Dip, 5.33 8.35 56.67 "Pull, 1867 10.60 22.27	
Hips, 323 336 4.03  Right Shoulder Elbow, 372 375 .81  Left Shoulder Elbow, 370 373 .82  Right Elbow Tip, 461 464 .66  Left Elbow Tip, 459 463 .88  LENGTH, Right Foot, 261 262 .39  Left Foot, 260 261 .39  STRETCH OF ARMS, 1782 1794 .68  HORIZONTAL LENGTH, 1731 1749 1.04  STRENGH of Lungs, 1.32 1.64 24.25  Back, 133 154 15.80  Legs, 149 185 24.17  R. Forearm, 28.5 45.4 17.93  L. Forearm, 28.5 45.4 17.93  L. Forearm, 28.5 45.4 10.0 13.00  Dip, 5.33 8.35 56.67  Pull, 867 10.60 22.27	Vital Organs.
Right Shoulder Elbow,         372         375         .81           Left Shoulder Elbow,         370         373         .82           Left Shoulder Elbow,         370         373         .82           Right Elbow Tip,         461         464         .66           Left Elbow Tip,         459         463         .88           LENGTH, Right Foot,         261         262         .39           STRETCH OF ARMS,         1782         1794         .68           HORIZONTAL LENGTH,         1731         1749         1.04           STREEGH of Lungs,         *1.32         1.64         24.25           "         Back,         *133         154         15.80           "         Legs,         *149         185         24.17           "         R. Forearm,         *25.4         40.0         13.00           "         Dip,         *5.33         8.35         56.67           "         Pull,         *8.67         10.60         22.27	Bone.
Left Shoulder Elbow, 370 373 .82 Right Elbow Tip, 461 464 .66 Left Elbow Tip, 459 463 .88 LENGTH, Right Foot, 261 262 .39 Left Foot, 260 261 .39 STRETCH OF ARMS, 1782 1794 .68 HORIZONTAL LENGTH, 1731 1749 1.04 STRENGH of Lungs, 1.32 1.64 24.25 Back, 133 154 15.80 Legs, 149 185 24.17 R. Forearm, 28.5 45.4 17.93 L. Forearm, 25.4 40.0 13.00 Dip, 5.33 8.35 56.67 Pull, 86.67 10.60 22.27	Bone.
Right Elbow Tip, 461 464 .66 Left Elbow Tip, 463 488 LENGTH, Right Foot, 261 262 .39 . Left Foot, 260 261 .39 STRETCH OF ARMS, 1782 1794 .68 HORIZONTAL LENGTH, 1731 1749 1.04 STRENGH of Lungs, 41.32 1.64 24.25 Back, 4133 154 15.80 Legs, 41.32 1.64 24.25 Legs, 41.32 1.64 24.25 Legs, 41.32 1.64 24.25 Legs, 41.32 1.64 15.80 Legs, 41.32 1.64 15.80 Legs, 41.3 15.4 17.93 Legs, 41.7 19.8 18.5 24.17 L. Forearm, 48.5 45.4 17.93 L. Forearm, 48.5 45.4 17.93 Dip, 5.33 8.35 56.67 Pull, 86.67 10.60 22.27	Bone.
Left Elbow Tip, 459 463 .88  LENGTH, Right Foot, 261 262 .39  "Left Foot, 260 261 .39  STRETCH OF ARMS, 1782 1794 .68  HORIZONTAL LENGTH, 1731 1749 1.04  STREEGH of Lungs, 1.32 1.64 24.25  "Back, 133 154 15.80  "Legs, 149 185 24.17  "R. Forearm, 28.5 45.4 17.93  "L. Forearm, 25.4 40.0 13.00  Dip, 25.33 8.35 56.67  "Pull, 1867 10.60 22.27	Bone.
LENGTH, Right Foot, 261 262 39  Left Foot, 260 261 39  STRETCH OF ARMS, 1782 1794 68  HORIZONTAL LENGTH, 1731 1749 1.04  STRENGH of Lungs, *1.32 1.64 24.25  "Back, *133 154 15.80  "Legs, *149 185 24.17  "R. Forearm, *38.5 45.4 17.93  "L. Forearm, *35.4 40.0 13.00  "Dip, *5.33 8.35 56.67  "Pull, *8.67 10.60 22.27	Bone.
" Left Foot, 260 261 .39 STRETCH OF ARMS, 1782 1794 .68 HORIZONTAL LENGTH, 1731 1749 1.04 STRENGH of Lungs, 1.32 1.64 24.25 " Back, 1.33 154 15.80 " Legs, 149 185 24.17 " R. Forearm, 28.5 45.4 17.93 " L. Forearm, 25.4 40.0 13.00 " Dip, 5.33 8.35 56.67 " Pull, 8.67 10.60 22.27	Bone,
STRETCH OF ARMS, 1782 1794 68 HORIZONTAL LENGTH, 1731 1749 1.04 STREAGH of Lungs, "1.32 1.64 24.25 1.64 24.25 1.64 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1.65	Bone.
HORIZONTAL LENGTH, 1731 1749 1.04  STRENGH of Lungs, *1.32 1.64 24.25  Back, *133 154 15.80  Legs, *149 185 24.17  R. Forearm, *28.5 45.4 17.93  Dip, *5.33 8.35 56.67  Pull, *8.67 10.60 22.27	Bone.
STRENGH of Lungs, *1.32 1.64 24.25 Back, *133 154 15.80 Legs, *149 185 24.17 R. Forearm, *28.5 45.4 17.93 L. Forearm, *25.4 40.0 13.00 Dip, *5.33 8.35 56.67 Pull, *8.67 10.60 22.27	anna.
Back, *133 154 15.80 Lege, *149 185 24.17 R. Forearm, *28.5 45.4 17.93 L. Forearm, *35.4 40.0 13.00 Dip, *5.33 8.35 56.67 Pull, *8.67 10.60 22.27	Museular Power.
Legs, '149 185 24.17  R. Forearm, '38.5 45.4 17.93  L. Forearm, '55.4 40.0 13.00  Dip, '5.33 8.35 56.67  Pull, '8.67 10.60 22.27	Muscular Power.
R. Forearm, '38.5 45.4 17.93 L. Forearm, '35.4 40.0 13.00 Dip, '5.33 8.35 56.67 Pull, '8.67 10.60 22.27	Muscular Power.
" L. Forearm, "35.4 40.0 13.00 " Dip, "5.33 8.35 56.67 " Pull, "8.67 10.60 22.27	Muscular Power.
" Dip, 5.33 8.35 56.67 " Pull, 8.67 10.60 22.27	Muscular Power.
" Pull, '8.67 10.60 22.27	Muscular Power.
0.00 10.00 22.21	Muscular Power.
UNG CAPACITY, 4.03 4.33 7.45	Vital Organs.
TOTAL STRENGTH, 414 518 25.13	Muscular Power.
Av. 6.08	seasonal Conet.

a-Kilos. b-Units. c-Litres. All others millimetres.

# Average Measurements of Male and Female Students.

		AMHERST STUDENTS.		MT. HOLYOKE AND WELLESLEY STUDENTS.		DIFFER- ENCE.	
		METRIC SYSTEM.	ENGLISH SYSTEM.	METRIC.	ENGLISH.	ENGLISH	
WEIGHT,		*60.7	4133.8	55.2	121.6	11.2	
HEIGHT,		1727	67.9	1591	62.6	5.3	
**	Sternum,	1415	56.	1276	50.2	5.8	
44	Navel,	1037	40.8	937	36.8	4.	
44	Pubes,	862	33.9	784	30.8	3.1	
11	Knee,	476	18.7	422	16.6	2.1	
- 66	Sitting,	898	35.3	825	32.4	2.9	
GIRTH, H		565	22.2	561	22.	.2	
" N	eck,	350	13.7	323	12.7	1.	
	hest repose,	870	34.2	750	29.5	4.7	
	hest full,	924	36.3	801	31.5	4.8	
	elly,	729	28.7	662	26.	2.7	
	ips,	887	34.9	846	33.3	1.6	
	ight Thigh,	501	19.7	531	20.9	-1.2	
	oft Thigh,	503	19.8	531	20.9	-1.1	
	ight Knee,	359	14.1	353	13.8	.3	
441	oft Knee.	358	14.1	351	13.8	.3	
2.00	ight Calf,	344	13.5	337	13.2	.3	
	eft Calf,		13.4	336	13.2	.2	
	ght Instep,	343	9.6	214	8.4	1.2	
Att	Maria de la companya della companya	245		212	8.3	1.2	
	oft Instep,	243	9.5	248	9.7	1.2	
	pper Right Arm, R. A. Contract'd,	255	10.	255	10.	1.4	
		291	11.4	244	9.6	.2	
-	pper Left Arm,	249	9.8	219	8.6	1.2	
	ight Elbow,	249	9.8	219			
200	oft Elbow,	244	9.6	218	8.6	1.	
	ight Forearm,	260	10.2	1000000	8.6	1.6	
	eft Forearm,	254	10.	216	8.5	1.5	
	ght Wrist,	165	6.4	147	5.7	.7	
	eft Wrist,	164	6.4	146	5.7	.7	
BREADTH		154	6.0	147	5.8	.2	
**	Neck,	108	4.2	90	3.5	.7	
***	Shoulders,	431	16.9	364	14.3	2.6	
- 16	Nipples,	193	7.6	188	7.4	.2	
- 11	Waist,	249	9.8	210	8.2	1.6	
**	Hips,	326	12.8	318	12.5	.3	
Right Shoulder Elbow,		373	14.6	335	13.2	1.4	
Left Shoulder Elbow,		371	14.6	334	13.1	1.5	
Right Elbow Tip,		462	18.1	421	16.6	1.5	
Left Elbow Tip,		459	18.0	418	16.4	1.6	
LENGTH, Right Foot,		261	10.2	229	9.0	1.2	
**	Left Foot,	260	10.2	229	9.0	1.2	
	OF ARMS,	1787	70.3	1603	63.1	7.2	
44	Back,	*126.2	4278.	49.1	108	170	
44	Legs,	*152.8	4336.8	67.8	149.4	187.4	
11	R. Forearm,	*38.7	685.3	22.0	48.4	36.9	
- 66	L. Forearm,	*35.46	478.3	19.2	42.3	36.	
Capacity of Lungs,		4.12	251.4	2.39	145.8	105.6	









# COMPARATIVE STUDY

# \*AVERAGE MEASUREMENTS\*

Amherst, Mt. Holyoke and Wellesley Colleges.

## THE COMPARISON.

It is the purpose of this paper to make a comparative study of the male and female figure as made from the examination of New England college students. The measurements from which the deductions are made, are the averages for five freshman years, compiled from statistics of about five hundred individuals, each, at Amherst, Mt. Holyoke, and Wellesley Colleges, between 1884-1889.

It is true that they are not data taken from fully developed manhood and womanhood, since the average age of each sex is approximately 19 years, and yet they seem to show that at this stage of the development of the human body, such conditions as will average are true.

will appear are true.

The stature of man is influenced by climate, occupation, surrounding circu etc.; races having their own distinctive characteristics. Likewise, different classes in the same race are distinguished from each other but not in so marked a degree.

Many of the fundamental differences in regard to figure, which distinguish the male from the female, are established by common experience and scientific investigation; on from the female, are established by common experience and scientific investigation; on these points our observation only corroborates such knowledge. For instance, in all the tests of strength, man is naturally the stronger as he is superior in the capacity of lungs. Such well known facts regarding the breadth of hips and waist are too well established to need any more than a passing confirmation.

Take first the matter of weight. One naturally supposes that the male weighs proportionately more than the female; but such is not the case. The figures declare an almost exact correspondence, each weighing 1.9 pounds for every inch of height.

The fact that the girth of the female thigh actually exceeds that of the male, is deablissed due not to the museulor development but to the presence of fat. An inter-

The fact that the girth of the female thigh actually exceeds that of the male, is doubtless due not to the muscular development but to the presence of fat. An interesting fact is brought to light in comparing the girth and breadth of head and also of the neck. The difference in per. cent in girth of the head in favor of the male is only .007, while the difference in breadth is .045. This would seem to show that the antero-posterior diameter in woman is longer proportionally than the transverse diameter. This is more markedly evident in the neck, which shows a difference of .077 in girth and of .166 in breadth. That is, a woman's head and neck are more oval in shows that the ward's.

in girth and of .166 in breadth. That is, a woman's head and neek are more oval in shape than the man's.

Considering next the height from pulses to sternum and figuring in this case from total height as a basis, it appears that the male is over 7% taller than the female, but in length of trunk he exceeds her by 11%. The same is true as regards the distance between the pulses and navel, the male being 12% longer here than the female and only 7% taller. This conclusion is contrary to the usual theory that woman has a proportionally longer trunk than man. In the length of the lower limbs there is a difference of 9% in favor of the male; but in the length of the head and neck the female actually exceeds the male by .009%. So the difference lies here rather than in the length of trunk, or lower limbs.

Humphrey, in comparing the human figure with that of the lower animals, says that "in man the segments nearer the trunk are comparatively lengthy; the more distal ones being comparatively short. Thus the thigh and arm are respectively longer than the leg and forearm," and "that the greater proportionate length of the thigh is one of the characteristics of the human figure." The result of this is, he says, "that strength is sacrificed to celerity and nicety of movement, as well as to a ready subservience to the will."

Leaving the lower kingdom and making the same comparison between the sexes of the human race it appears that the female follows out this same evolutionary progres-sion to a greater proportionate degree than the male. Perhaps it was because she had the advantage of being last introduced, but more likely to give her the greater celerity and grace of movement.

The male is nearly 12% longer in the leg than the female and only 6% in the thigh.

In the upper extremities, however, the measurements almost correspond, there being only one per cent. difference in favor of the male.

Such are some of the most apparent suggestions presented by these tables. But they are here offered in the printed form to any persons who may desire to examine them more minutely or give a different or more searching study to them.

I am indebted to the kindness of Miss Lucile E. Hill and M. Anna Wood of Wellesley, and Dr. Mary Cotton of Mt. Holyoke, for the measurements of their colleges.



## Three Tables of Measurements of Students of Amherst College, 1800-1.

		AVERAGES OF 2000		MEAN MEASURES		AVERAGES OF STUDENTS		
		MEASURES.		OF 2086 STUDENTS.		21 YEARS OLD.		
		METRIC SYSTEM.	ENGLISH SYSTEM.	METRIC.	ENGLISH.	METRIC.	ENGLISH.	
WEIGH	T,	*61.2	434.9	64.0	141.1	63.1	138.8	
HEIGH	T,	1725	67.9	1720	67.7	1726	67.9	
10	Sternum,	1410	55.5	1410	55.5	1407	55.3	
**	Navel,	1030	40.6	1023	40.3	1025	40.4	
**	Pubes,	860	33.9	860	33.9	864	34.0	
44	Knee,	476	18.7	480	18.9	477	18.7	
**	Sitting,	903	35.5	910	35.8	903	35.5	
GIRTH.	, Head,	572	22.5	570	22.4	572	22.5	
44	Neck,	349	13.8	350	13.8	856	14.0	
44	Chest repose,	880	34.6	880	35.6	892	35.1	
44	Chest full,	927	36.5	925	36.4	933	36.7	
44	Belly,	724	28.5	720	28.3	725	28.5	
44	Hips,	893	35.1	890	35.0	898	35.3	
- 64	Right Thigh,	517	20.3	515	20.3	521	20.5	
- 66	Left Thigh,	512	20.1	510	20.1	519	20.4	
66	Right Knee,	361	14.2	360	14.2	359	14.2	
- 66	Left Knee,	359	14.1	360	14.2	358	14.1	
- 64	Right Calf,	359	14.1	359	14.1	350	13.8	
44	Left Calf,	849	13.8	350	13.8	348	13.7	
- 66	Right Instep,	245	9.6	240	9.4	244	9.6	
	Left Instep.	242	9.5	240	9.4	243	9.6	
**	Upper Right Arm,	257	10.1	260	10.2	264	10.3	
	U. R. A. Contract'd,	295	11.6	295	17.6	304	11.0	
- 64	Upper Left Arm,	253	9.9	250	9.8	259	10.2	
44	Right Elbow,	251	9.8	250	9.8	253	9.9	
44	Left Elbow,	247	9.7	250	9,8	249	9.8	
**	Right Foresrm,	267	10.5	270	10.6	266	10.5	
44	Left Forearm,	261	10.2	260	10.2	259	10.2	
44	Right Wrist,	166	6,5	165	6.5	166	6.5	
44	Left Wrist,	165	6.5	165	6,5	165	6.5	
BREAD	TH, Head,	155	6.1	154	6.1	155	6.1	
**	Neck,	108	4.2	110	4.3	109	4.3	
- 11	Shoulders,	430	16.9	430	16.9	431	16.9	
11	Nipples,	198	7.8	200	7.9	200	7.9	
14.	Waist,	250	9.8	250	9.8	256	10.1	
- 11	Hips,	323	12.7	320	12.6	827	12.9	
Right Sh	oulder Elbow,	373	14.7	370	14.6	374	14.7	
Left Sho	ulder Elbow,	371	14.6	370	14.6	374	14.7	
Right El	bow Tip,	461	18.1	460	18.1	462	18.1	
Left Elb	ow Tip,	459	18.1	460	18.1	459	18.1	
LENGT	H, Right Foot,	260	10.2	260	10.2	261	10.2	
- 44	Left Foot,	259	10.2	260	10.2	260	10.2	
STRET	CH OF ARMS,	1780	70.1	1770	69.7	1794	70.6	
HORIZO	ONTAL LENGTH,	1732	68.2	1730	68.1	1738	68.4	
	GTH, of Lungs,	*1.5	43.30	1.2	2.64	1.41	3.10	
- 11	Back,	*137	4302	150	330	146	321	
**	Chest dip,	h6.0	6.0	4	4	7.8	7.3	
	Chest pull up,	19.0	9.0	10	10	10.2	10.2	
**	Legs,	*166	365	175	385	172	378	
**	R. Forearm,	41.5	491	40	88.2	41.5	91.3	
44		*38.1	484	87	81.6	39.5	86.9	
	of Lungs,	*3.77	230	3.90	238	4.23	250	

~≈1891.≈~~

#### THE PROGRAM



TWENTY-SEVENTH

# WINTER MEETING OF IN-DOOR SPORTS

AND HEAVY GYMNASTICS,

# \* 12th LADD PRIZE EXHIBITION \*

PRATT GYMNASIUM, AMHERST COLLEGE, MARCH 25,

## \*WEDNESDAY, AT 2 O'CLOCK IN THE AFTERNOON.\*

JUDGES OF AWARD:

MR. E. H. FALLOWS, of New York,

MR. A. A. STAGG, Springfield, Mass.,

DR. E. P. HARRIS, Amherst, Mass.,

MR. W. A. HUNT, Amherst, Mass.

MR. F. E. WHITMAN, Amherst, Mass.

The College Orehestra have kindly consented to give the audience the pleasure of their music.

Mr. R. M. BAGG, Leader.

Mr. W. E. NASON, Manager.

First Violins, R. M. Bagg, and H. LEWIS.

Clarinet, S. R. FLEET.

Cornet, T. BRECK.

Piano, H. G. KIMBALL.

Bass, F. M. TIFFANY.

War The Glee and Banjo Clubs assisted by Tom. Browne, the king of whistlers, at College Hall to-night.

### ORDER OF EVENTS.

Led by A. A. EWING, '92, College Gymnast.

TUMBLING.

ROPE CLIMB.

F. Allen, '91,	H. C. Wood, '93,	T.C. IN LOUIS	
N. D. Alexander, '92,	H. A. Russell, '93,	H. H. Walte, 92,	T. Kimball, '93,
		G. T. Pettengill, '92,	E. Bliss, '93,
E. P. Smith, '92,	H. B. Hallock, 33,	T. Coyle, '92,	F. J. Raley, '93,
L. W. Griswold, 92,	A. B. Davidson, '93,	G. B. Brooks, 33,	F. A. Crockett, '93.
A. A. Ewing, '97,	C. Seymour, 74.	Co. Br. Britishing Co.	4.11.0101111111111111111111111111111111
T. Coyle, '92,		1.1	2nd
College Borord, 51 seco	note V. II Smith 700	Ist	286
Cornelle mocard, at med	HERE, E. F. CHILLIS PE		
Ist	2nd	STANDING HIGH JUMP.	
JM	288	F. B. Walker, '91,	
PARALLEL BARS.			G. B. Brooks, '93,
		A. A. Ewing, 92,	A. B. Davidson, '93,
T. Coyle, '92,	T. Kimball, 93,	L. W. Griswold, 92,	F. W. Cole, '93,
G. Pettengill, '92.	F. J. Raley, '95,	M. A. Johnson, '92,	F. D. McAllister, '94.
G. B. Brooks, '93,	F. Munson, 94.	L. T. Byron, 363.	
to be become out		College Becomi, 4 feet 11)	took or M. A. William Tol.
Zat	2nd	Conside meconic a teer til	money, r. a. omey, m-
HIGH KICK.		2st	2nd
	22202		
F. A. Hicks, '92,	G. Zug, '93,	CLUB SWINGING.	
F. R. Avery, '92.	A. Turner, '93.		D. H. Brahman 500
W. W. Gregg, '92,	C. D. Norton, 93.		f, F. W. Beekman, '93,
F. W. Cole, '93,	F. D. Edgell, '93.	L. Byron, 93,	M. A. Johnson, '92,
College Becond, 9 feet 1 is		W. Tower. 93,	C. Emerson, '94.
Consign mecons, 9 rees 1 to	en, n. n. Lucingion, 31		
4.4	2nd	Ist	2nd
Ist	288	241111111111111111111111111111111111111	
PUTTING SHOT.			
		WRESTLING.	
F. Allen, '91	G. S. Raley, '92,	W. C. Smalley, '92,	E. Bliss, '93,
N. D. Alexander, '92,	F. D. Edgell, '93,		H. Russell, '93,
C. Burbank, '92,	R. L. Pellet 94.	W. Lewis, '92,	
A. A. Ewing, '92,		R. Scott, '92,	W. A. Talcott, 33,
		C. Burbank, '92,	F. J. Raley, 93,
College Becord, 37 feet 10 in	ches, N. D. Alexander, 72.	G. Forbes, '92,	W. H. Ross, '93,
	201	N. D. Alexander, '92,	F. D. Edgell, '93,
Ist	200	G. S. Raley, '92,	H. P. Gallinger, '93,
PERCE VALLE		T. Coyle, '92,	E. M. Nourse, 'id.
FENCE VAULT.		M. Baldwin, 93,	C. G. Wood, '93,
A. A. Ewing, '92,	A. V. Woodworth, 93,		F. Munson, '94,
R. L. Scott, '92.	S. R. Parker, 93,	F. M. Lay, '93,	F. Munson, 74,
L. W. Griswold, 92,	H. B. Hallock, 98,		
F. R. Avery, '92,	E. H. Stedman, '94.	Heavy Weight	***********
	E. H. Steuman, Pt.		
E. B. Brooks, '93,		Light Weigh	d
College Becord, 7 feet	luch, C. F. Clark, '92.		
		DESCRIPTION WHEN THE	
Int	2nd	RUNNING HIGH JUMP.	
OWNERS BINGS		W. T. S. Jackson, 92.	H. Hallock, '93,
SWINGING RINGS.		G. L. Degener, '92.	F. Cole, '93,
A. A. Ewing, '92,	G. B. Brooks, 'ES.	A. A. Ewing, '92,	C. Bray, '96,
H. H. Walte, '92,	E. Bliss, '93,		T. M. Kimball, 93.
W. T. S. Jackson, '92,	F. J. Raley, 93.	G. B. Shattuck, '92,	C. R. Hogdon, '93.
W. I. S. Jackson, DZ,	F. d. Basey, no.	L. Byron, '93,	C. R. Hogdon, 30.
	2nd	G. Zug, '93,	
Ist	288	College Becord, 5 feet 41 in	ches, R. B. Ludington, 'M.
BATULE BOARD.			
		Ist	254
C. L. Upton, '91,	G. Zug, '93,		
A. A. Ewing, '92,	H. B. Hallock, '93,		
R. W. Goodell, '92,	C. R. Hogdon, '93,	HORIZONTAL BAR.	
H. H. Waite, '92,	G. H. Fisher, '93.	T. Breck, '91,	T. Kimball, '93,
C. E. Hildreth, '92,	G. H. Fisher, So.	H. H. Walte, '92.	F. J. Haley, '93,
			G. B. Brooks, '83.
College Record, 7 feet 6]	Inches, C. L. Upton, '81.	A. A. Ewing, '92,	G. B. Brooks, 20.
Ist	2nd	Ist	2nd
SPARRING.		MOTH TANK	
F. J. Lane, '92,	T. Trask, 93,	POLE VAULT.	
E. W. Babcock, '92,	W. Talcott, '93,	C. Upton, '91,	G. W. Emerson, Jr., '92,
C. E. Burbank, 72,	J. Kemmerer, '93,	A. A. Ewing, '92,	G. B. Brooks, '93.
		N. D. Alexander, '92.	H. B. Hallock, 93.
H. S. Nichols, '92,	A. W. Gill, 93,		icker, 94.
G. S. Raley, '92,	O. H. Story, '93.		
		College Record, 9 feet	Il inches, A. Ewing, '95,
Heavy Weight			
Links Whiche		1st	264
Lagat Weight			

# Anthropometric Results.

When working for a result, we are much more successful if we can get it in more

When working for a result, we are much more successful if we can get it in more ways than one.

The Department of Physical Education in Amberst College has been looking after an anthropometric college standard for about twenty-five years. To this end thouses and so of student measurements have been made and tabulated, and progress published from time to time as a supplement to Gymnastic Exhibition Programs. About thirty of these statements have been thus issued, which were preliminary to, and have aided in the preparation of the tables on the opposite page. We want to learn what are the Physical Data of the Typical or Ideal College Student, and to do this we know of no better way than to observe every student whom we can lay our hands upon, put our measuring appliances upon, and secure all the measures which show the proportions of the "Average" or the "Mean" student. And from this standpoint we must, by labor and study, find out how much proper cultivation and healthy work can better this present average condition: find out how much and how fast we can further decelog the present student average body.

The past history of the Human Race shows us that we have been led forwards and upwards by the influences which have been conceived and partially developed in the Universities and Colleges—the world over. And if the intellectual and spiritual forces are found there, may we not expect that the body, the earthly partner of the soul, will be fairly represented by these men. For as the College fills its ranks from all grades of society, from what other source can we get a more general or comprehensive group to work upon, or gain an idea of a more fair representation of our universal physical man, than from this source? Therefore we offer as the nost desirable materials for this purpose, the yoring men of our colleges, who have attained their majority in age, and are mainly of American origin. And for the results of this paper we bring the measurements of about 2000 students of Amherst College of the average age of tw ways than one.

The Department of Physical Education in Amherst College has been looking

doctrine of means rather than that of averages, because the result is not affected by extreme or exceptional cases.

To know the measurements of the men who are of the average age of all who are observed will certainly give additional light on the proportions of the physical pattern which we are to work from. The third table gives the average measures of 326 college men who were between 21 and 22 years of age.

There are thus presented here three distinct methods to help determine the pattern of the College Student. To these in due time it is hoped a percentile table may be added.

