(where $\alpha = \frac{2\pi e^2}{hc} \sim \frac{1}{137}$), but their potentials are everywhere in that ratio. This leads to a mass for the magnetic pole of $\frac{m}{4\alpha^2}$ where m is the mass of the electron. If now the Dirac equation for the combination of two poles is examined the normal level turns out to have an energy corresponding to a mass approximately (within a factor 2) equal to that of the proton. Moreover, the energy differences between adjacent levels are of the order of 10^9 volts. This is therefore by far the simplest system so far considered which could explain the emission of cosmic radiation.

The proton is of course a combination of a neutron and a positive electron. These then suffice for the building of nuclei. The process of β emission is obvious, even though there are no electrons in the nucleus.

Unfortunately, the considerations mentioned here suffer because the relativistic two body problem has not yet been solved. It can only be hoped that the reduction to a one body problem, which was resorted to in all the examples given, will prove a working approximation in these cases as it has in other cases, where, however, relativistic effects were less important.

I am indebted to Drs. Millikan and Anderson for their kindness in making me acquainted with their experimental results.

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SEPTEMBER 10, 1932

LIGHT A FACTOR IN RANCIDITY

IN the June 3 (1932) issue of SCIENCE is published a brief résumé of the work carried on by the Food Research Division of the Bureau of Chemistry on the subject indicated. The conclusions confirm in general the results which had been obtained in these laboratories and which were made public at the spring meeting of the American Chemical Society, held at Columbus, Ohio, from April 29 to May 3, 1929. Our study of the catalytic activity of various wave-lengths of light upon the oxidation of fats and oils has shown that light transmitted by blue glass is the least effective in this respect, while that transmitted by amber glass is the most effective.

The results will shortly be published in one of the scientific journals.

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AN UNUSUAL COTTON PLANT

ON June 8, 1932, the writer, accompanied by Mr. Philip Beltrán, was studying the Tangüis cotton in the Pisco Valley. On Hacienda "San Jacinto," a most interesting plant was found. The fibers produced by this plant were uniformly $1\frac{3}{8}$ inches long, with the exception of from 15 to 20 per each seed which measured $1\frac{3}{4}$ inches. These extra long fibers had the same general characteristics as the others, but were very prominent because of the extra length. All the cotton of the plant was picked, and each seed has been carefully examined. The long fibers were found on every one. In every instance, these long fibers were attached at about the middle of the seed and the number per seed varied only slightly. The writer has examined hundreds of plants of Tangüis and other varieties of cotton, but never before had seen such a variation in the length of the fiber.

The Tangüis cotton originated from a single plant found by Señor Fermín Tangüis, Hacienda "Urrutia," Pisco. A careful study of this variety has given sufficient evidence to state that the first plant was undoubtedly a field hybrid between one of the native Peruvian cottons and an unknown variety of American Upland cotton grown in Peru under the name of "Suave" or "Egipto."

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A METEOR IN WISCONSIN

AT 8:25 P. M., on August 22, a meteor of great brilliancy and of unusual size passed over central Wisconsin. The light was so brilliant that the landscape was lighted up as by a powerful searchlight and sharp shadows of trees were cast on the street in front of my house. We first saw it in the S-W quadrant at an apparent elevation of approximately forty-five degrees. Before it disappeared it had crossed the east-west line, with which its path made an angle of about twenty degrees. That is, the direction of its flight was west, twenty degrees north.

Its apparent angle of fall was about forty degrees. The real angle of its path with the horizon must have been considerably less or else its height was very much greater than we estimated (one mile). Its apparent size was about that of the full moon, it was dazzlingly white with a greenish blue blaze of color close to its surface.

Both my son, Dr. H. E. Culver, and his wife, as well as myself distinctly saw what appeared to be melted globules rolling back and disappearing in the fiery train which streamed out behind the meteor. Nothing was observed by us to fall toward the earth and we heard no sound as the meteor passed, but some two

minutes—estimated—after its disappearance we heard quite a loud report as of an explosion. Other observers in various parts of the state report hearing a roaring sound and all, without exception, report that an explosion either accompanied (the disappearance) or else followed the disappearance at varying intervals according to different observers.

Reports from several localities spoke of the finding of fragments of the meteorite. All these localities were visited by me and the specimens examined with negative results in all cases.

At Neillsville, Wisconsin, some 60 miles west of Stevens Point, I talked with two intelligent observers separately—who estimated the flight to be further north than I did. One thought the course a little east of north and the other that it was a little west of north. They were both out in the open (golf links) and so had a very fine view of the spectacle. One of them thought the object was as large as a bushel basket; the other said it seemed to him as large as a gasoline barrel. The meteor was seen as far south as Racine and as far north as Green Bay, Wis., a distance of about 150 miles.

G. E. CULVER

STEVENS POINT, WISCONSIN
SEPTEMBER 6

REPORTS

DOCTORATES CONFERRED IN THE SCIENCES BY AMERICAN UNIVERSITIES, 1931–1932

THE Research Information Service of the National Research Council, with the cooperation of the registrars of the various American universities, is again able to present information regarding the doctorates in science.

The following data for the academic year 1931–32 supplement those in SCIENCE 72: 357–358 (1930) and 74: 659–660 (1931), where a survey is given for the period 1898–1930 and 1930–1931.

Detailed data for the year 1931–1932, with the comparative statistics for the past ten years and with the names of the recipients of the degrees and the

TABLE I

DOCTORATES CONFERRED ACCORDING TO SUBJECTS

	'23	'24	'25	'26	'27	'28	'29	'30	'31	'32
Chemistry	185	251	250	257	270	278	310	317	390	420
Zoology	45	42	71	55	70	89	91	102	117	127
Physics	54	58	59	76	92	78	101	91	94	113
Psychology	46	51	51	60	74	66	112	97	105	104
Botany	64	57	69	69	53	61	76	81	81	79
Mathematics	28	32	24	47	46	44	61	75	73	75
Engineering	5	5	2	11	10	28	34	49	25	47
Bacteriology	32	12	20	21	20	29	26	27	38	46
Physiology	20	17	17	43	35	28	37	46	46	46
Geology	34	41	25	27	42	35	45	63	39	45
Pathology	21	12	5	4	16	31	27	31	26	43
Agriculture	10	11	16	19	19	31	27	29	45	31
Anatomy	10	5	4	11	13	11	15	12	11	16
Astronomy	6	7	3	7	9	3	8	4	11	8
Med. and Surg.	..	..	..	..	..	..	..	4	2	8
Public Health	..	..	..	3	4	4	15	8	20	8
Metallurgy	2	2	3	10	4	13	8	4	5	7
Anthropology	3	3	2	5	3	5	13	6	7	6
Geography	7	3	13	11	14	7	12	17	6	5
Archeology	0	0	0	0	0	0	2	2	2	3
Paleontology	2	2	1	7	0	1	2	6	3	2
Seismology	..	..	..	..	..	..	..	..	..	2
Meteorology	0	0	0	0	0	0	2	0	0	0
Mineralogy	1	1	4	4	2	0	1	3	1	0
Totals	575	611	640	748	796	842	1025	1074	1147	1241

TABLE II

DOCTORATES CONFERRED ACCORDING TO UNIVERSITIES

	'23	'24	'25	'26	'27	'28	'29	'30	'31	'32
Chicago	71	75	59	78	86	70	99	94	82	116
Wisconsin	44	41	64	53	55	60	66	86	86	88
Cornell	41	60	39	43	62	67	60	80	57	80
Johns Hopkins	58	44	36	50	44	56	62	58	67	67
Ohio State	21	20	33	25	30	25	48	50	74	61
Columbia	58	57	51	49	62	46	61	44	51	58
Minnesota	17	23	23	30	29	41	53	53	47	58
Yale	34	22	41	38	34	38	47	43	53	57
Michigan	15	25	15	32	30	52	38	55	55	55
California	27	20	31	38	42	37	50	47	48	48
Illinois	33	20	32	44	31	36	34	43	45	46
Harvard	31	35	25	35	42	33	40	40	49	45
Iowa	12	16	19	28	24	32	38	28	33	43
Iowa State	..	9	12	14	13	26	28	26	39	34
Mass. Inst.	11	18	18	13	18	13	20	29	16	32
Pittsburgh	7	5	8	7	11	13	8	15	15	31
Pennsylvania	8	12	12	14	27	18	24	26	19	27
Princeton	9	17	15	12	18	17	25	22	16	27
Calif. Inst.	0	9	8	15	8	18	22	18	23	21
Stanford	8	14	15	17	17	17	26	26	28	21
Indiana	5	5	8	7	5	8	9	11	7	16
Brown	3	3	8	4	4	5	7	9	7	14
New York	10	2	5	7	4	11	13	10	23	13
Washington	0	1	3	1	1	5	8	5	6	13
Cincinnati	3	4	7	8	5	1	14	6	13	12
Penn. State	..	..	..	..	1	4	3	3	8	11
Northwestern	2	6	2	4	6	8	5	8	13	10
Rutgers	..	..	..	2	3	9	4	5	5	10
Texas	1	0	0	1	3	0	7	6	5	10
Nebraska	2	5	7	2	2	3	4	6	7	9
Wash. U. St. L.	8	2	0	5	7	2	7	7	8	8
West. Reserve	..	..	..	..	..	..	3	5	9	8
Catholic	1	3	3	6	5	8	6	2	7	7
Duke	..	..	..	..	..	..	4	4	5	7
Kansas	2	2	4	8	8	5	10	11	5	7
Radcliffe	3	2	3	3	2	1	2	5	2	7
Colorado	1	0	1	3	1	3	3	2	3	5
G. Washington	13	5	6	4	4	2	5	2	3	5
Mich. State	0	0	1	4	2	2	6	2	8	5
Missouri	0	5	4	3	7	2	3	6	9	5
Rochester	..	..	1	0	3	3	0	2	5	5
St. Louis	..	..	..	..	2	3	2	3	4	5
Virginia	1	3	5	5	8	3	5	12	9	5
American	..	..	..	3	3	3	1	5	3	3
Bryn Mawr	0	1	1	2	4	0	1	2	1	3
N. Carolina	2	1	0	7	3	4	3	6	12	3
Syracuse	0	0	0	2	3	2	1	5	1	3