George A. Dorsey, of the Field Columbian Museum, will preside over Section H, Anthropology.

You are cordially invited to be present at this meeting, and to contribute papers on topics connected with your field of research. It is to be hoped that at this first meeting of the Association under the new rules Section H may make an effort to set even a higher standard of excellence and secure a greater wealth of material of interest from its members than at any of its previous winter meetings. Field work has been carried on with almost unprecedented vigor during the last year, and it is hoped that the results may be freely offered to the Section.

It is desirable that a preliminary program be distributed in advance of the meeting, and in order to render this possible, titles of papers should be sent to the secretary as early as possible. Abstracts of papers, or the papers themselves, may be sent later at the author's convenience, whose attention is called to the fact that no title will appear in the final program until the paper, either in full or in abstract, has been passed upon by the sectional committee.

Roland B. Dixon,
Secretary Section H.
Harvard University, Cambridge, Mass.
November 1, 1902.

SHORTER ARTICLES.

EXCEPTIONS TO MENDEL'S LAW.

In a former paper on 'Quantitative Studies on the Transmission of Parental Characters to Hybrid Offspring,'* I presented data in support of the provisionally stated law that, 'in the second generation of hybrids of similar breeding (with close fertilization) the same types tend to occur, and in definite proportions; two of these types are like the parents, the others include all possible intermediate forms.'† At the time that paper was prepared the writer was not aware that others had published anything on the same subject. We now know that Mendel, De Vries, Correns and Bateson have shown that the same law applies to the third and later generations. With this extension, and with a slight alteration of the second clause to be noticed below, the above statement accords with Mendel's original statement of the law he discovered. It happened that in all my hybrids certain characters obeyed a law different from Mendel's, hence the form in which the second clause of the law is stated above. The data in my original paper were arranged to illustrate the law as stated. That certain characters did obey Mendel's law may be easily shown by rearranging the data with reference to that law. In five out of fourteen crosses between varieties of wheat, one parent was bearded, the other smooth. In all these cases beards were recessive. Mendel's law would, therefore, call for 25 per cent. of bearded plants in the second generation of the hybrid. The actual results obtained were as follows:

Male.	Female.	Plat No.	Per cent. Bearded Plants.
Valley.	Little Club.	C 16	14.0
"	" "	C 18	27.2
"	" "	C 21	35.9
		Average,	25.7
Little Club.	Emporium.	F 26	23.2
" "	"	F 30	30.0
" "	"	F 31	22.7
" "	"	F 32	28.0
" "	"	G 1	19.2
" "	"	G 2	24.0
		Average,	24.6
Lehigh.	Red Chaff.	F 13	21.5
"	" "	F 15	30.3
"	" "	F 17	26.0
		Average,	25.9
Little Club.	Valley.	J 6	23.9
" "	"	J 7	24.1
" "	"	I 19	17.6
" "	"	J 3	26.2
" "	"	J 4	25.3
" "	"	J 8	26.4
" "	"	J 9	23.4
" "	"	J 10	24.9
" "	"	J 12	41.6
" "	"	J 13	19.6
" "	"	J 14	24.3
		Average,	25.2

This last cross is the reciprocal of the first.

* Bul. 115, Off. Ex. Sta., U. S. Dept. Agric., pp. 88–98.

† L. c., p. 93.

Male.	Female.	Plat No.	Per cent. Bearded Plants.
Turkey.	Little Club.	D 2	40.6
"	" "	D 8	26.1
"	" "	D 9	27.1
"	" "	D 10	27.7
"	" "	D 11	28.7
"	" "	D 15	36.6
"	" "	D 16	29.1
		Average,	30.8

The agreement between results and theory is here close enough to confirm the theory in this case.

There were likewise five crosses in which one of the parents had velvet chaff. This proved to be a dominant character (except in one individual plant), and the second generation should therefore show 75 per cent. of plants having velvet chaff. The results follow:

Male.	Female.	Plat No.	Per cent. Bearded Plants.
Jones' Winter Fife.	Little Club.	B 5	75.2
" " "	" "	B 6	79.9
" " "	" "	B 7	68.7
" " "	" "	B 8	69.4
" " "	" "	B 11	78.2
" " "	" "	B 12	72.9
" " "	" "	C 1	72.6
" " "	" "	C 4	70.4
" " "	" "	C 5	75.5
" " "	" "	C 2	74.0
" " "	" "	J 16	77.3
" " "	" "	J 17	68.0
" " "	" "	K 1	73.2
" " "	" "	K 2	75.1
" " "	" "	K 3	71.6
" " "	" "	K 4	77.2
" " "	" "	K 5	72.1
" " "	" "	K 6	72.6
" " "	" "	K 8	76.1
" " "	" "	K 11	76.4
" " "	" "	K 13	73.0
" " "	" "	L 1	73.9
		Average,	73.4
Jones' Winter Fife.	Red Chaff.	E 21	77.5
" " "	" "	E 22	74.4
" " "	" "	E 24	57.4
" " "	" "	E 25	67.1
" " "	" "	F 2	75.6
" " "	" "	F 3	71.7
" " "	" "	F 11	77.0
		Average,	71.5
Farquahar.	Red Chaff.	F 23	74.3
Farquahar.	Little Club.	I 6	80.0
"	" "	I 7	63.8
"	" "	I 8	72.4
"	" "	I 12	76.8
"	" "	I 16	87.4
"	" "	I 17	85.7
		Average,	77.7

A single first generation plant (I 15) of this last cross had glabrous chaff. It is interesting to note that velvet chaff was not recessive in the ordinary sense, for in this case one fourth of its progeny should have had velvet chaff. But neither this plant nor any of its progeny had this character. This is an instance in which a parent character wholly disappeared in the hybrid, and did not reappear. The significance of this is not clear unless the velvet-chaffed parent was itself a hybrid having latent characters in it. There is some evidence that this was the case. The next cross is the reciprocal of the last. In it there were 27 plats in the second generation, each the progeny of a single first generation plant. Nine of these plats were extremely irregular in character. In five of them bearded plants appeared, though neither parent was bearded. On the whole, the results are such as might be expected if some of the original Farquahar parents had been hybrids not fixed in character. Most of the varieties used in my work had been carefully selected to type for three years, but in a few instances this was not the case, though I have no records now to show details on this point. The per cent. of plants having velvet chaff in each of the remaining eighteen plats of this cross was as follows:

Male.	Female.	Plat No.	Per cent. Bearded Plants.
Little Club.	Farquahar.	G 4	80.3
" "	"	G 5	92.6
" "	"	G 13	79.2
" "	"	G 14	93.3
" "	"	G 16	82.2
" "	"	G 18	74.6
" "	"	H 2	69.6
" "	"	H 6	69.9
" "	"	H 7	71.0
" "	"	H 8	72.6
" "	"	H 9	80.4
" "	"	H 10	70.9
" "	"	H 11	73.1
" "	"	H 12	75.1
" "	"	H 14	78.5
" "	"	H 15	75.5
" "	"	H 16	71.7
" "	"	H 17	77.7
		Average,	77.2

As far as beards and velvet chaff are concerned, it is seen that these hybrids obeyed Mendel's law in a very satisfactory manner.

In all the fourteen crosses one parent had the short head characteristic of the club group of wheats, while the other had the common long form of head. In general the first generation of hybrids were intermediate between the parents in this respect. In the second generation the progeny of each plant of the previous generation presented every gradation between the parents, presenting a continuous series, which, in most cases, extended beyond both parents. Correns mentions such a series in some of his hybrids, and offers the explanation that in some individuals the character of the male parent is dominant, in others, the corresponding character of the female parent, while in the remaining individuals there are all degrees of variation as regards the dominance of this pair of characters. I shall not take issue with him, but will offer a different hypothesis to explain the facts. According to Mendel's theory, when a pair of characters separate, they do so completely. For instance, if a hybrid has in it both the bearded and the beardless character, on the formation of pollen and ovules, the one character passes entire into some of the pollen grains and ovules, the other passes entire into the others. This would indicate that the character of beard-producing is due to something which retains its individuality during the process of germ cell formation; and so for all characters that obey Mendel's law. Is it not possible, however, that the protoplasmic basis of some characters, instead of passing entire into the germ cells, itself splits up in all possible proportions, so that we may find pollen grains and ovules possessing all degrees of the tendency to develop a certain character. This hypothesis would explain the behavior of my hybrids with reference both to length of heads and color of chaff.*

Recurring now to the form in which I first stated the law governing the transmission of parent characters in hybrid offspring, I would modify the second clause of the law to read as follows: With reference to some of the parent characters, the second generation of a hybrid presents all possible combinations of the characters of the two parents; with reference to other characters, the hybrids (second generation) show every possible gradation between the characters of the two parents.

The first clause here applies to character pairs that separate in the manner called for by Mendel's theory; the second clause applies to characters which separate in all possible proportions. I am at present unable to present data for the third and later generations of my hybrids, since the work I inaugurated at Pullman, Washington, is now in other hands, but I hope to be able to do so in the near future.

W. J. Spillman.
U. S. Department of Agriculture.

* Since the above was written I find that Professor Bateson has proposed the same hypothesis. See Rep. Evol. Com., Royal Society.

NOTES ON INORGANIC CHEMISTRY.

'The Chemical Composition of Insecticides and Fungicides' is the title of Bulletin No. 68 of the Bureau of Chemistry, U. S. Department of Agriculture, just issued by the government. Its author is J. K. Haywood, chief of the Insecticide and Agricultural Water Laboratory. The investigation of the subject of the report was undertaken with the cooperation of the Division of Entomology. Through the state experiment stations and special agents, samples were procured from different sections of the country of the various insecticides and fungicides on the market, and the report embodies the analyses of some one hundred and fifty. Of these nearly one third were Paris green, and a dozen more were London purple. Most of these samples were excellent in quality, few only showing an excess of soluble arsenious oxid and still fewer revealing any suspicion of adulteration. Of the insecticides sold under fancy names and containing arsenic not as much can be said. Some of them are excellent, but many reveal a large proportion of inert matter. If the price were correspondingly low this would not be an objection, but where a mixture of gypsum with less than two per cent. of Paris green is sold at five cents per pound it is an imposition on the purchaser. The soaps, hel-