mental energy' "; in other words, if I understand him aright, a kind of constitutional disease. Further, each of its constituent "factors" is a "symptom" of this diseased state. Hence, I take it, *Drosophila melanogaster* is afflicted with 4 of these constitutional diseases, of varying severity, since some exhibit many more "symptoms" (factors) than others. *D. obscura*, on the contrary, suffers from 5 such "diseases," and *D. virilis* from 6. Whether the greater intensity of linkage in the males indicates a greater severity of affection, I do not gather. I repeat that this is the only meaning that I can extract from his words; if I am mistaken, I apologise. Prof. MacBride also states that a unit-factor is a *change*, which to me is unintelligible. He also indulges in some speculations about the origin of mutations. This, however, has nothing to do with the point I raised, namely, the distribution of segregating factors, by whatever means originated, among the gametes.

Neither are the beliefs of Dr. Bateson or of Prof. Johannsen at issue. "What the policeman said is not evidence" holds good for science as well as for law. The facts alone concern us, and I have tried to confine myself to such simple facts as with the aid of half-a-dozen stocks of Drosophila could be easily imparted by practical demonstration to a class of undergraduate students, and are regularly so demonstrated in numerous American universities.

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## A Metastable *P* Term in the Manganese Arc Spectrum.

THREE years ago Wentzel (*Phys. Zeit.*, 24, 104, 1923) pointed out that a metastable state of the manganese atom was to be expected and as evidence of this directed attention to a fivefold *D'* term. So far as the author is aware, *P'* terms in this spectrum have never been identified although they also should be expected.

In a letter to NATURE by Mr. Beese and me (December 26, 1925, p. 936) attention was directed to the fact, noticed by me, that in many spectra the frequency of the first *pp'* group is near to the difference of frequency between the two lowest energy levels in the same system, both in the spectrum concerned and in the spectrum of the once more ionised atom.

Dr. R. V. Zumstein, National Research Fellow at the University of Michigan, has kindly pointed out to me a group of six lines in the manganese spectrum. During Dr. Zumstein's researches on absorption in the spectrum of manganese (to appear in the *Physical Review*) these lines were found to be reversed in a heavy manganese arc but not absorbed by heated manganese vapour. These lines, therefore, must arise from low-lying energy levels in the atom but not from the normal state. Three of the lines were tentatively designated by Catalán (*Phil. Trans.* 223 A, 127, 1922) as the fifth triplet of the sharp series in what is now known to be the octet system. However, the intensities of these three lines are not in the usual order and are much too great for this assignment. The reversal of these lines in the heavy arc, while the other triplets of the sharp series are not reversed, makes it certain that Catalán's assignment is incorrect.

The above-mentioned group of six lines satisfied the relation pointed out in the first paragraph for the location of the *pp'* group, and, on examination, these six lines are found to form a normal *pp'* group. The data are given in Table I. The principal narrow triplet is the first triplet in the sextet principal series. The first triplet in the septet system of ionised manganese is seen to be actually entwined with the *pp'* group. The *pp'* group is seen to be normal in structure. The behaviour of these lines in the arc and absorption as described above is in accord with their assignment as a *pp'* group. The Zeeman pattern has apparently never been determined for this group of

TABLE I.

*PP'* GROUP IN MANGANESE I.

| | | | | | |
|---|---|---|---|---|---|
| Principal Narrow Triplet, Mn I $\nu$ = | | | | | 35769·4<br>725·82<br>690·07 |
| *PP'* Group . . . . $\nu$ = | | | | | 38512·7<br>554·5<br>683·4<br>686·4<br>815·6<br>857·1 |
| Principal Triplet, Mn II . $\nu$ = | | | | | 38366·03<br>542·94<br>806·52 |
| | | 2592·95 (5)<br>38554·5 | | | $P_0'$ |
| | | *131·9* | | | |
| 2595·77 (4)<br>38512·7 | *173·7* | 2584·12 (3)<br>38686·4 | *129·2* | 2575·51 (5)<br>38815·6 | $P_1'$ |
| *170·7* | | *170·7* | | | |
| 2584·32 (4)<br>38683·4 | *173·7* | 2572·77 (5)<br>38857·1 | | | $P_2'$ |
| $P_2$ | | $P_1$ | | $P_0$ | |

lines. However, there seems little room for doubt that these lines are a *pp'* multiplet in the octet system of Mn I, involving a metastable threefold *P* term. Since the *pp'* frequency is so near $^7S_3 - {}^7P_4$, the limit of the $^8P'$ terms must correspond to an ionised manganese atom excited in a $^7P$ state.

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## "Alchemistische Decknamen."

IN their recent paper under the above title (*Sitzungsber. d. Phys.-Med. Sozietät*, Erlangen, Bd. 56, pp. 17-36, 1924) Profs. Wiedemann and Ruska used (among others) the Dresden MS. 210, which contains a list of "Decknamen" for iron, copper, tin, lead, mercury and sal-ammoniac, twenty-four for each substance. It may be worth recording that a list so similar as to point to a common origin occurs in the British Museum MS. *Add.* 25724, ff. 15 *verso*-17 *recto*. This gives 24 names each for iron, copper, sulphur, tin, lead, mercury and sal-ammoniac, so that it affords a check upon Wiedemann and Ruska's list in the case of the six bodies mentioned, and supplements it with the names of sulphur, which are missing from the Dresden MS. The two MSS. agree in being anonymous, while the caption at the head of the list in the Dresden MS. is identical with that in the Brit. Mus. MS.

i. *Iron.*—Names 1-5 and 7-24 are the same in both lists. The Dresden No. 6, *al adqār*, is replaced by *al-ashqar* ("the ruddy") in the Brit. Mus. MS. The latter reading appears to be preferable; I find no authority for Wiedemann and Ruska's translation of *adqār* as "Fuchsfarbige."

ii. *Copper.*—The two lists agree in all 24 names, except that the Brit. Mus. MS. reads *nāwūs* (sarcophagus) for *ṭāwūs* (peacock). It is difficult to say which