Table 2. THE ACHROMATS' MOTHERS

	Red–green test	Yellow–blue test
Man's mother (age 58)	Deviation not abnormal Matching range : normal	Deviation not abnormal Matching range : frequency, 8/213 women
Woman's mother (age 58)	Red deviation : frequency, 18/231 women Matching range : frequency, 9/213 women	Deviation not abnormal Matching range : frequency, 8/213 women

results, comparing the frequencies of the parent's abnormalities with those found in a standard population[3].

It will be seen that both fathers had abnormal green deviations and red–green matching ranges, but that the enlarged matching range of the woman's father was their only yellow–blue defect, although their ages were 62 and 58.

The woman achromatope's mother had an abnormal red deviation and red–green matching range, but the man's mother was normal in red and green. The mothers had no abnormal yellow–blue deviations, although both their ages were 58, but each had an abnormal yellow–blue matching range.

Although only four parents of achromats were tested, a number of infrequent differences from the normal were found, and these results suggest that tests on a larger number of the near relatives of achromats might confirm the suspicion that this defect has a tendency towards heterozygous manifestation. Both achromats were only children.

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Tactic Movements in *Chlamydomonas moewussi*

SPECIES of *Chlamydomonas* are generally regarded as phototactic[1]. For a study of certain aspects of phototaxis, *Chlamydomonas moewussii* (Pringsheim collection 11–16 *g*) was cultivated on a medium described by Hutner and Provasoli[2]. The algae in their culture medium were placed in cuvettes which were illuminated from the side. Under these conditions, phototactic algae move rapidly to the illuminated side of the cuvette. The species studied showed no such phototaxis, but invariably moved to the water–gas interface. If the cuvettes were covered with olive oil, the algae moved through the oil layer to the interface. The gas phase was therefore altered. Square glass cuvettes (v. 35 ml.) were filled with 15 ml. algal suspension and fitted with rubber stoppers with in and outlet tubes. The gas phase (20 ml.) of each cuvette was flushed with 2 litres of gas mixture and the cuvettes then closed. The cuvettes were then placed under conditions of unilateral illumination. In parallel experiments, algae of the same age and culture were used. Table 1 summarizes the results of the different treatments.

Table 1. EFFECT OF FLUSHING GAS PHASE WITH VARIOUS MIXTURES AND OBSERVING BEHAVIOUR OF ALGAE AFTER 24 HR. IN CLOSED SYSTEM

Illumination \ Gas phase	Air	Nitrogen	Air + 50 per cent CO_2	Air + 75 per cent CO_2	100 per cent CO_2	Gas and liquid flushed with CO_2-free air
300 ft.-candles	++	+	++	++	++	–
1,000 ,,	++	+	++	–	–	–

++, strong tactic movement to water–gas interphase.
+, slight tactic movement to water–gas interphase.
–, settling out.

When the gas phase was flushed with nitrogen, the tactic movement became less marked, but still existed. When the gas phase was swept out with carbon dioxide-free air and in addition the stream was bubbled vigorously through the solution for some time, there was complete settling out of the algae, when the algae were left in the closed cuvettes.

Flushing the gas phase with air containing various amounts of carbon dioxide led to unexpected results. At concentrations up to 50 per cent carbon dioxide, there was marked taxis towards the air–water interface at all light intensities. With more than 50 per cent carbon dioxide, however, at 75 per cent and 100 per cent, the algae settled out when exposed to light intensities of 1,000 ft.-candles and more. When the algae were exposed at the same concentration of carbon dioxide to 300 ft. candles, there was no settling. Moreover, transfer of algae exposed to 300 ft.-candles and 100 per cent carbon dioxide for one day to 1,000 ft.-candles did not cause subsequent settling. In all cases when there was settling out, the algae recovered if re-exposed to air after 24 hr. This recovery was characterized by redistribution of the algae throughout the medium with some concentration at the water–air interface. Apparently, recovery of lost motility is involved in this process.

The lack of taxis when all carbon dioxide is swept out from gas and medium, and the decreased taxis when carbon dioxide is removed from the gas phase but not from the medium, points to the correlation of tactic movement to the presence of carbon dioxide. It appears that the *Chlamydomonas* species studied shows taxis towards carbon dioxide.

The reason for the difference in behaviour at different light intensities is not clear. *p*H cannot have been a factor, as the conditions were identical for the two light treatments. However, the temperature at 1,000 ft.-candles was higher than that at 300 ft.-candles. Air controls showed no settling, nor did the lower concentration of carbon dioxide. It is possible that the settling out effect was a combination of higher concentration of carbon dioxide and raised temperatures.

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