10 bivalents at metaphase 1 with perfectly normal meiosis. In view of the fact that more than 80 species of the genus *Silene*[1] possess the basic number 12, the present number ($n = 10$) is significant. There is, however, one species, *S. fortunei*[2], with $n = 15$. These facts suggest that, first, the presence of the haploid numbers like $n = 10$ and 15 in the genus indicates that the original basic number of this series is 5. *S. conoidea* is, therefore, tetraploid and *S. fortunei* is hexaploid. Hence, both these species are what may be called 'cryptic polyploids'. Here it may be of interest to mention that the present observations reveal that the grade of ploidy built on $x = 5$ is from $4x$ to $6x$, while on $x = 12$ it is from $2x$ to $16x$ [1].

Secondly, with the present observations the genus becomes dibasic ($x = 5$ and 12) and this at once raises the question about the probable constitution of $x = 12$, that is, whether it has been compounded from $x = 6$, or from $x = 5$ and 7. However, to date $x = 6$ and 7 have neither been discovered in any species of the genus, nor their presence surmised on even indirect grounds. In any event, the cytogenetical relationships between $n = 10$ in *S. conoidea* on one hand, and $n = 15$ in *S. fortunei* and species with $n = 12$ on the other, pose interesting problems. Furthermore, so far $x = 5$ has neither been found nor inferred on indirect grounds in any of the Silenoideae, but with the present observations one may be tempted to relegate $x = 15$, found in some genera of the subfamily, to only $x = 5$.

Lastly, in view of the overwhelming occurrence of $x = 12$ in the genus *Silene*, it is worthwhile to determine the biosystematical relationship of the species with $x = 5$, that is, whether the latter are genuine members of the genus.

Saponaria vaccaria Linn. is another very common annual weed. Several different samples of this species reveal the presence of $n = 15$ and $2n = 30$, which confirms the earlier findings of Mulligan[3]. Again this number is unique, since the prevailing situation in the genus is $n = 14$ [1]. Apparently, this genus also becomes dibasic with $n = 14$ and 15, and it is worthwhile to find out the cytogenetical relationship between the two numbers. Such a study would also reveal the true taxonomical relationship of the present taxon with the typical species of the genus *Saponaria*. Another important aspect is the biosystematic relationship of *S. vaccaria* with the genus *Vaccaria*. Such a study is needed, particularly because, first, the present results reveal that the genus *Vaccaria* exclusively possesses $n = 15$, and secondly, *S. vaccaria* has been in the past often treated taxonomically as a member of the genus *Vaccaria*.

The above aspects are being studied in detail and I shall be obliged for viable seeds of *Silene fortunei* and any species of *Saponaria*, *Vaccaria* and their allied genera.

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PSYCHOLOGY

The Brain as Regulator

There has been some debate whether the brain is determinate or probabilistic in its behaviour. As a contribution to this question, the following argument shows that from one point of view the determinate system is demonstrably of greater efficiency than the probabilistic. The physiologist may therefore expect to find that natural selection has made the brain as determinate as possible.

If the brain is regarded as basically a means to survival, then a necessary condition for survival is that against the (moderately well-defined) set of disturbances that threaten the organism's existence the brain must so respond that the outcome of the combined action of disturbance and response keeps the organism's essential variables within normal limits[1-3]. The brain must, in other words, act as a regulator, homeostatic in the general sense. The sequence of disturbances that comes to the organism can then often be treated (algebraically at least) as an information source (in Shannon's sense[4]) having an entropy, $H(D)$ say. Similarly, the sequence of responses will have an entropy $H(R)$, and so will the sequence of values at the essential variables, $H(E)$. It is necessary for survival (though not sufficient) that $H(E)$ be kept small.

The most interesting case is that in which, if the organism does nothing, *all* the changes at D produce changes at E (that is, the organism is passively buffeted to full degree). In this case $H_R(E) = H_R(D)$, and it then follows[2] that $H(E)$'s minimum is given by $H(D) + H_D(R) - H(R)$. So far as $H_D(R)$ is concerned, the expression will be least if $H_D(R) = 0$. This relation gives a necessary condition that the brain must satisfy if it is to have maximal efficiency in generalized homeostasis.

The meaning of $H_D(R) = 0$ is readily specified. Of any source A, $H(A) = 0$ implies that the Markov chain must be such that when it reaches equilibrium the transitions that still occur are determinate (that is, have probabilities all 0 or 1). $H_D(R) = 0$ implies that this tendency to determinateness must hold for each value of D.

Thus, if the brain is survival-promoting by acts of regulation, it has maximal efficiency (other things being equal) if, under constant external conditions, it tends towards the deterministic way of behaving.

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A Differential Test of Arts/Science Aptitude

The increasing pressure of academic specialization raises the question of whether we can discover a test of differential aptitude for advanced work in arts and science subjects respectively. In a preliminary study, the performance of a large number of Cambridge undergraduates on a test of high-grade intelligence (*A.H.5*) has been analysed, with special reference to relative ability on the verbal, numerical and diagram-