by the present writer. Here the paired filaments or chromonemata of the individual chromosomes are spiral but run parallel to one another. Thus in certain cases the reproductive chromatids or chromonemata are contrasted with the somatic ones by the fact that they run parallel instead of in opposite directions. The present author has found the parallel condition to be present in the gametophytic soma of species of Trillium.

The situation outlined in the foregoing paragraphs seems to set the whole cytological situation in the somatic (mitotic) and reproductive (meiotic) divisions in a new light and establishes if confirmed by other observers a much closer resemblance between the two than has in the past been realized. The mode in which the contrast in chromatidal behavior between reproductive and somatic elements in Trillium and Tradescantia, etc., is achieved still remains to be elucidated.

It is worth while to add perhaps that the present course of investigation, which covers not only plants but a considerable number of animals, serves to set in relief the great superiority of good vegetable objects, such as Tradescantia, Trillium, etc., over the tailed Amphibia, such as Amblystoma, Necturus and Cryptobranchus, for the fundamental study of the chromosomes. Apparently, however, the same general chromosomal conditions prevail in the two great divisions of living beings.

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THE ROLE OF KINESTHESIS IN MAZE LEARNING

FROM the results of an early investigation by Watson[1] in 1907 the idea prevailed for some time that the only sense indispensable to maze learning in rats is the kinesthetic. However, in 1929 Lashley and Ball[2] demonstrated that the elimination of kinesthetic impulses by means of spinal sections did not abolish the perfected maze habit. Evidence showing that kinesthesis was unnecessary to the *learning* of the maze habit was soon forthcoming when Ingebritsen[3] demonstrated learning in rats that were deprived, prior to training, of kinesthetic impulses by sectioning of the cervical cord. Thus, kinesthesis was found unnecessary not only to the perfected habit but also to the learning of the habit.

There is now evidence that if all senses but the kinesthetic are abolished maze learning in rats is impossible. Previous tests by the writer had shown that the senses of vision, olfaction and audition, but not the tactual sense, play a rôle in maze learning, and it was therefore necessary only to render a group of rats blind, deaf and anosmic, but not tactually anesthetic, in order to show whether or not learning is possible when only the kinesthetic sense remains. A group of 45 blind-deaf-anosmic rats trained on a 14-blind elevated maze showed no signs of learning after 22 days of training (44 trials on the maze). The performance of these animals, measured by entrances into blinds, at the end of training was no whit better than the performance on the first trial; the performance of the group on the 22nd day was a "chance" performance.

It may be concluded, therefore, that not only is kinesthesis unnecessary both to learning and to the perfected habit, but that learning on the basis of kinesthesis alone is impossible. The evidence against kinesthesis would seem to be overwhelming. Far from being the one indispensable sense, kinesthesis appears to have no rôle whatever in the acquisition of the maze habit. But this conclusion, in view of other facts, would be hazardous. The smooth functioning of a well-learned motor habit or skill no doubt has in it a large kinesthetic element. It has been assumed that each movement in such a habit furnishes the stimulus for the succeeding movement, and that the smooth succession of movements is due to the close chaining of movements made possible by movement-produced stimuli. Our evidence shows, however, that the close chaining is possible only after the correct order of movements is learned on the basis of other classes of stimuli. Kinesthesis, in other words, seems to be essential to the acquisition of skill, that is, to the smooth flowing of movements, but this function it can assume only in conjunction with other classes of stimuli and only after learning has begun on the basis of other stimuli. Though Ingebritsen's animals learned the maze it is improbable that they could ever run through it with the speed and skill possible to normal rats.

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[1] J. B. Watson, *Psychol. Rev. Monog.*, 7: 2, 1907.
[2] K. S. Lashley and J. Ball, *Jour. Comp. Psychol.*, 71–106, 1929.
[3] O. C. Ingebritsen, *Jour. Comp. Psychol.*, 14: 279–294, 1932.

THE DATES OF PUBLICATION OF THE EARLIER NEW YORK STATE MUSEUM REPORTS

THE assertion has been repeatedly heard by members of the museum staff that the dates of publication of the earlier museum reports and bulletins are not reliable.

A typical case came to the writer's attention in connection with the catalogue of Devonian types now under preparation. The question of the priority of the term *Dolichocephala lacoana* Claypole, over *Stylonurus excelsior* Hall, which has been claimed by Beecher (1900) and others, came up. Investigation