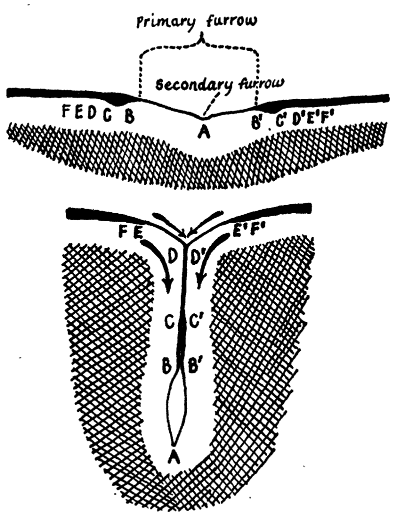

FIG. 1. Diagram illustrating the manner of cortical growth described in the text. Cortical pigment is shown as a solid black line. Remainder of cortex white. Subcortical cytoplasm cross-hatched. The top sketch represents an early stage of cleavage, the lower one a more advanced stage. Arrows indicate direction and approximate site of growth. Corresponding portions of the cortex indicated by letters A, A′, etc.

my own work which shows that the cortex (of the *Strongylocentrotus, Arbacia* and *Triturus* eggs, respectively) is a more or less rigid layer during cell division.

A reasonable explanation of the observed cortical growth, in view of its localized character, is that the increase may be due to an imbibition process, which of course does not imply that the cortex becomes "fluid." Indeed there are indications that the cortex of the furrow, excepting a small part near its tip, does not differ much in viscosity from the rest of the egg cortex. At least the difference is not great enough to give rise to the characteristic surface contours of fluids in contact with relatively solid materials. It is well known that the swelling pressure of bio-colloids may attain high values under proper conditions, and the relatively fluid material which Chambers[1] ascertained in the equatorial region of the cleaving egg would offer little resistance. It is also possible that the growth of the furrow-cortex is by intussusception of clear cytoplasm of *sub*-cortical origin; this might explain the part played by the cytoplasm which some workers have seen streaming toward the furrow. Both processes might be involved, since they are obviously not antagonistic.

This view of the mechanism of cell division has certain features in common with the sol-gel transformations generally regarded as important in the formation of pseudopodia in certain amoebae. The *protrusion* of the pseudopodium involves the localized growth of a peripheral gel cylinder at the expense of a centrally located sol. Is it a mere superficial coincidence that the *intrusion* of the cell surface seems also to involve a localized growth of peripheral cytoplasm at the expense of the more fluid elements of the cell?

Details will be published elsewhere.

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HOW CONSISTENT ARE AN INDIVIDUAL'S BRAIN POTENTIALS FROM DAY TO DAY?

IN a previous article, we showed that an individual can be distinguished from other individuals by his brain potentials.[1] An important and related question left unsettled was: Are an individual's brain potentials consistent from time to time?

To answer this question, we obtained on five different days (as a rule not consecutive) an adequate sampling of brain potentials from each of 11 healthy university students (6 men, 5 women). No attempt was made to run a subject at a certain time of the day or to control in any way his daily routine of living. A strong effort was made, however, to keep the experimental conditions as constant as possible from subject to subject and from day to day for the same subject. The observer reclined on a cot in a dark and electrically shielded room. He was instructed to keep his eyes closed and his mind as "blank" as possible. The brain potentials were led off from the left occipital area by means of a surface electrode. A ground electrode was attached to the lobe of the left ear. Standard amplifiers and a Westinghouse oscillograph were used for recording.

Because of the amount of space necessary to display them, the 55 records (5 records from each of 11 subjects) were divided into three groups, two groups of 20 records each and one group of 15 records. Each group contained all the records of 3 or of 4 subjects, as the case might be. The records in each group were thoroughly "shuffled" and chosen at random for pasting on a wall. One group was studied at a time. Each record was given a number. Four of us, who had served as judges in the previous study on identification, served again here. The task was to study the mounted records and to arrange them according to their numbers into groups of five. Each group of five was to have in it all the records, and only the records, of one subject. The person comparing the records was not told whether he was wrong or right in his judgments until he had finished with an entire group of 15 or 20 records.

A total of 220 judgments were made (4×55).

[1] L. E. Travis and A. Gottlober, SCIENCE, 84: 532, 1936.

Ninety-one per cent. of the records were correctly assigned (20 errors). Three of us made 4 errors each, and one of us made 8 errors. One of us made no errors in one group of 20 records, and another of us in the other group of 20 records. One of us made no errors in either of the two groups of 20 records each. According to the law of probability, by chance one could expect to assign accurately 20 records once in 488,864,376 times, and 15 records once in 126,126 times. We feel that chance played practically no rôle whatsoever.

As was to be expected, the records of some individuals were more distinctive and consequently more easily grouped than were those of other individuals. The records of 6 of our subjects were strikingly similar and consequently difficult to classify. Such criteria as frequency, amplitude and form of the waves played their part in making accurate judgments possible. Also, we evaluated the records as a whole, considering such factors as trains of waves, stability of the base-line, and fluctuations in the frequency and amplitude of the waves. No other cues incident to photography, handling of the paper or differences in the width of the time-line could possibly contribute to the accuracy of our judgments, since always the records of *different* individuals were taken, developed and handled together. This means that cues arising from such sources would make the same individual's records unlike instead of alike.

Our conclusion is that not only can an individual be distinguished from other individuals by his brain potentials, but under relatively constant experimental conditions an individual's brain potentials are highly consistent from day to day.

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MICROSTRATIFICATION OF THE WATERS OF INLAND LAKES IN SUMMER

THE thermal stratification of temperate lakes into three general regions in summer, namely, epilimnion, thermocline and hypolimnion, has been known for many years. Recent investigations show, however, that there is also a sharply marked microstratification in the thermocline and hypolimnion which has not been found hitherto. This phenomenon was discovered by means of a new type of apparatus for measuring the transparency of water, which is similar to that employed by Hans Pettersson[1] on Norwegian fjords; it was used on several Wisconsin lakes during the past summer and gave some very interesting results, four of which are illustrated in Fig. 1.

[1] H. Pettersson, *Jour. du Conseil Int. pour l'Expl. de la Mer*, 10: 1, 1935.

The apparatus consists of a light source, which is a three candle power automobile light bulb, and a photo-electric cell for a receiver; each of these is mounted in a metal water-tight housing which has a flat glass window about three centimeters in diameter. The light and receiver are attached to a piece of galvanized iron pipe one meter apart, with the windows facing each other. A condensing lens immediately in front of the light focusses a beam of parallel light on the photocell window.

Insulated wires lead from the housings of the light and photocell to a wire cable which connects them with the battery and the reading instrument in the boat. The cable is 35 meters long. An amplifier, a series of resistances and a potentiometer are included in the circuit for the purpose of amplifying the current from the photocell and also for the adjustment of the microammeter to any desired zero point. In its latest form a rubber hose is attached to the iron pipe for the purpose of pumping up samples of water from the different depths and also an electric thermometer for taking temperature readings. A separate light source for taking measurements of light scattering is also included.

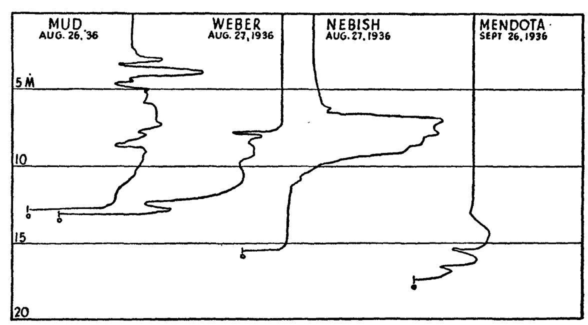

FIG. 1. Relative transparencies of the waters of four Wisconsin lakes at different depths.

The results obtained with this instrument show that the transparency is uniform throughout the upper stratum of water, or the epilimnion, which is kept in circulation by the wind (see Fig. 1). In the thermocline and hypolimnion, on the other hand, the water is stratified alternately into more transparent and less transparent layers. These layers may be only a few centimeters thick, as in Mud Lake, or they may be one or two meters thick, sometimes more. A marked decrease in transparency is always found within a meter or two of the bottom. Similar stratifications were found at different stations in the same lake, which indicates that it is not a local phenomenon.

The curve for Nebish Lake differs from the others in that a three-meter layer of water in the thermocline was more transparent than the epilimnion. In Mud