devices—perhaps even of inorganic materials—which would perform the essential functions of the conditioned reflex, we should be able to organize these units into systems which would show true trial-and-error learning with intelligent selection and the elimination of errors, as well as other behavior ordinarily classed as psychic. Thus emerges in a perfectly natural manner a direct implication of the mechanistic tendency of modern psychology. Learning and thought are here conceived as by no means necessarily a function of living protoplasm any more than is aerial locomotion.

In casting about for principles upon which to base the construction of a mechanism which would parallel the essential behavior of the conditioned reflex, the principle of endosmosis was at first considered. This was rejected both because its effects were too slow in taking place and because they were too slight in amount. An early model was constructed on the principle of potential changes. This gave some promise but was found to yield only two or three of the characteristic types of reaction required.

The mechanism which has given the best results is a combination of polarizable cells and mercury-toluene regulators, which are sensitive to temperature changes. Ordinary electric switches serve as "receptors"; a flashlight bulb is the responding "organ," analogous to the salivary gland of the experimental animal. By a manipulation of the switches in a manner strictly analogous to the presentation of stimuli in Pavlov's conditioned reflex experiments, phenomena, paralleling fairly accurately a considerable number of the properties of the conditioned reflex, are obtained. Thus far the following conditioned-reflex phenomena have been duplicated:

(1) The simple substitution of a stimulus.
(2) Complex redintegration.
(3) Irradiation of excitation.
(4) Weakening through lapse of time (forgetting).
(5) External inhibition.
(6) Experimental extinction.
(7) Reinforcement.
(8) Spontaneous recovery after experimental extinction.
(9) Differentiation.
(10) Differential extinction.
(11) Conditioned inhibition.
(12) The acquisition of conditioned reflexes only when the conditioned stimulus precedes the unconditioned stimulus.

It is hoped that further research will result in a model which will also show the phenomena of delayed reflexes, trace reflexes, responsiveness to temporal stimulus patterns and the various other complex behavior patterns characteristic of the conditioned reflexes as observed in mammals. A complete technical description of the apparatus is being prepared for publication.

The germinal idea of the present project originated with the first author; the design and construction of the mechanism is due entirely to the second.

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CHANGES IN THE RATE OF RESPIRATION OF THE FRUITS OF THE CULTIVATED BLUEBERRY DURING RIPENING

IN connection with work on the diseases of blueberries in New Jersey during 1926, a study was made of the rate of carbon dioxide production at three stages of ripeness in ten varieties of blueberries, mostly cultivated varieties of *Vaccinium corymbosum* L. The tests extended over a period of more than a month, the different varieties maintaining the same relative position whether picked early or late.

The most striking feature brought out by these experiments is that the greatest production of carbon dioxide occurs during the period of color development, that is, from the first pink coloration to the red-ripe stage. After the stage of full red coloration, the rate of carbon dioxide production decreases rapidly as ripening proceeds to the blue stage at which the fruit is picked. These changes in the rate of carbon dioxide production were shown clearly by the selection of three stages of ripeness—green, full size, showing no pink color; pink to red-ripe, and blue-ripe. A change in the rate of carbon dioxide production such as that herein described represents a condition which has not been previously reported for any fruit, nor has it been found in any of the other small fruits so far studied by the writer.

The variety Rubel produced carbon dioxide more slowly than any of the other varieties studied, which may have some significance in view of the fact that Rubel has shown the best keeping quality of any of the varieties which were tested. It is planned to repeat these studies with a wider range of varieties, particularly those of the recently developed varieties which have shown unusual keeping quality.

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AN INTERNATIONAL LIST OF GENERA OF VASCULAR PLANTS

FOR some years botanic gardens have corresponded in regard to possible simplification of the mutual exchange of seeds, including greater uniformity of arrangement and nomenclature for seed lists. It appears that the great works, the "Index Kewensis"