

first aecia the third season following infection. Some galls fruit when only two years old.

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A NEW BIBLIOGRAPHY OF SCIENTIFIC JOURNALS

A LARGE number of the principal libraries in the United States and Canada are now cooperating in the compilation of a check list of periodical literature which will be of great value to all workers in science. It will not be limited to scientific literature but will include practically all serials of a scientific nature that are held by one or more of the cooperating libraries. No classification is attempted. The list gives the full name of each serial (including academy publications), the places and dates of publication, variations in titles and an exact statement of the holdings of each cooperating library. For such workers as enjoy the privileges of a library which enters into the inter-library loan arrangement, this new list will provide access to practically every journal or society publication which has reached America. Others will be informed of the nearest library at which the desired reference may be consulted.

The new work will be called the Union List of Serials and will be published by the H. W. Wilson Company of New York. The Provisional Edition from A to R is now available in sections and the Final Edition, a volume of about twenty-five hundred pages and seventy-five thousand entries, will be ready late in 1927.

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SCIENTIFIC BOOKS

Brains of Rats and Men. A Survey of the Origin and Biological Significance of the Cerebral Cortex. By C. JUDSON HERRICK. xiii+382 pp., 53 figs. Univ. of Chicago Press, 1926.

IN the first eight chapters of "Brains of Rats and Men" the author lays the anatomical foundation for his discussion of the learning processes of rats and men which constitutes the latter part of the book.

The practically unlimited potentialities of diversity of cortical association combinations are argued mathematically upon anatomical data (Chapter I), and are regarded "adequate for any theoretic explanation of cerebral functions whatever." The author then shows (Chapter II) how there has been worked out in the cerebral cortex a mechanism of maximum efficiency adequate for the analysis of many afferent systems of different kinds and their regrouping through a wide

range of different pathways, a type of organization that is in strong contrast with the mass reflexes of the spinal cord and corpus striatum. The problem of the conditional reflex (Chapter III) is approached through an illustration of the neural mechanism of lower vertebrates, particularly fishes and amphibians, in relation to the behavior pattern. In a similar manner the evolution of the cerebral cortex (Chapter IV) is traced through the ichthyopsid (fishes and amphibians), sauropsid (reptiles and birds), mammalian and human types, and the genetic, structural and physiological interrelations of the cerebral cortex and the corpus striatum is analyzed for birds and reptiles (Chapter V), and for mammals (Chapter VI). The phylogenetic development of the thalamus is then comparatively treated through the ichthyopsid, sauropsid and human types, and the phylogenetic age of the thalamus (Chapter VII) is emphasized as a basis for appreciation of its bearing on physiological and psychological problems. In illustration of these relations a series of new diagrams (page 31) is introduced with good effect. In the treatment of the cerebral hemispheres (Chapter VIII) the marsupial brain as described morphologically by Obenchain, histologically by Gray and physiologically by Gray and Turner, is given large place, and somewhat similar studies of the brain of the rat by Furtuyn, Craigie, Sugita and Lashley are taken as the immediate approach to the discussion which comprises the latter part of the book.

In an effort to arrive at a true interpretation of "how rats learn" (Chapter IX) the author discusses, upon the basis chiefly of Lashley's work, the questions of strictly subcortical processes, special structures for facilitation of learning, short-circuiting of habit formation processes from cortical to subcortical mechanisms, disturbance of learned processes by cortical injury, interrelation of the amount of cortex functioning and the rate of learning, localization of cortical functions, equipotentiality, the relation of cortex to corpus striatum in the habit-learning process, and the unique rôle of the frontal cortex. Certain phases of this discussion are elaborated in detail (Chapters X to XIII), under the topics "Mechanisms of Learning in the Rat," "Localization of Learned Processes in the Cerebral Cortex of the Rat," "The Frontal Lobes" and "Association Centers." These topics are then reviewed (Chapter XIV) as a "Summary of Cortical Evolution." In his treatment of the "Subconscious" (Chapter XV) the author presents the cerebral cortex as an organ of creative automaticity that has designed and fabricated itself during its ontogenetic and phylogenetic development, and the working of which is intelligence. He insists that appeal to the "metaphysical, theological, mythologi-

cal, or other unscientific prejudices" can be escaped only by accepting consciousness as a function of the brain in the sense of a vital mode (Chapter XVI) like muscle contraction, nerve conduction or reflex physiological habit, and, therefore, as a causative factor in bodily activity. Allied with this vital function are systems of "vital reserves" (Chapter XVII) ranging from the simple reflexes to the more general reserves of the cerebellum and the specific mnemonic reserves of the cerebral cortex, the last of which is the source particularly of spontaneity, initiative and inventiveness. "Forward Reference" (Chapter XVIII) through symbolism "comes to fruition as conscious purpose," which is not a mystical force but the natural result of cortical processes which are natural results of previous bodily activities—the expression of vital reserves in cortical action.

The last chapter (XIX), which can not be briefly summarized but must be read in the light of what goes before in order to be fully appreciated, urges the consideration that man's behavior is not that of rats and monkeys simply enlarged and complicated, but contains new patterns not elsewhere known, in which habitude "gives way to insight in terms of generalization of experience, foresight of possible future consequences of action, the fabrication of consciously directed purposes, deliberative choice in view of these purposes, and finally the development of ideals of character and the shaping of daily conduct with a view to molding the personality in conformity with these ideals." Since "mind as cause" is in this unique pattern a "new vital mode" it is purely biologic. At the same time it pragmatically satisfies all requirements "esthetically, socially, morally."

In the preface Professor Herrick explains that this book is the outgrowth of a resurvey of the cerebral cortex, particularly in the light of "Lashley's fundamental experiments in the learning processes of rats," in search for a "common ground upon which objective psychology and introspective psychology may cooperate harmoniously without sacrifice of sound scientific method or of those distinct technical procedures which each of these sciences has hitherto so fruitfully employed." In line with this purpose the work appeals to the writer as an exceedingly valuable contribution, in which masterful, detailed knowledge of the nervous system blends with a comprehensive view of the field of psychology. Since the details of conduction paths are not introduced, profitable reading requires only a good knowledge of the general divisions of the brain and of cortical structure.

The personal touch given by the author's reference to his brother, the late Professor Clarence Luther Herrick, as his inspiration to scientific endeavor in the particular line of this work will meet an affection-

ate response on the part of all who knew that "unsurpassed teacher" as companion and friend.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A SIMPLE METHOD FOR THE DEVOCALIZATION OF DOGS

IN a laboratory situated within a residential district, it is frequently somewhat of a problem to keep a number of experimental dogs because of their persistent barking during their cage confinement. Training the animals to remain quiet requires a great deal of time and much more patience and is usually unsuccessful. If new dogs are being continually introduced into the laboratory it is impossible to prevent this annoyance except by depriving the dogs of their vocal function. The following method of devocalization is recommended for its simplicity and effectiveness. In the past year, successful devocalization has been accomplished on over one hundred dogs at the School of Hygiene and at the Biological Laboratory at Cold Spring Harbor, L. I., N. Y.

A head-holding device, as is illustrated in Fig. 1, is very inexpensive and is adaptable to almost any type of operating table. It is necessary to employ some such mechanism as this, as it is exceedingly difficult to procure a mouth-gag that is suitable for all sizes and types of dog mouths.

This apparatus was devised and built in the laboratory. The support (A) is of strap iron $1\frac{1}{4}'' \times \frac{3}{8}''$ bent as illustrated to conform to the dimensions of the table and the general proportions indicated in the figure. The horizontal portion is drilled ($\frac{1}{4}''$ holes) about two inches from each end (D and D') to accommodate two ring-bolts. If rope-holding clamps are available, they may be fastened to the support in place of the ring-bolts. The vertical portions of the support are drilled ($\frac{1}{4}''$ holes) at several three-inch intervals from the free ends, so that the height of the rack may be adjusted to the requirements of the animal. Small stove-bolts through a pair of these holes at corresponding levels hold the rack at the desired height. The ends of the support penetrate pieces of strap iron $3\frac{1}{2}'' \times 1\frac{1}{4}'' \times \frac{1}{8}''$, which are provided with slots to receive the ends of the support. Two holes are drilled in each of these plates to take the wood-screws or bolts which fasten them to the top of the table flush with the surface. The rack is further secured by two pieces of strap iron $3\frac{1}{2}'' \times 1\frac{1}{4}'' \times \frac{1}{8}''$, sufficiently offset to embrace each end of the support. These are fastened to the table by bolts, as