A possible clue to the situation here comes from experimental biology. In the regeneration of hydroids the number of tentacles regenerated is correlated with the size of the regenerating mass of tissue. Child has shown that each separate structure develops from a nodal point in the system of gradients within the mass. He has suggested that there is a minimal distance of separation for the development of diverse gradients limiting the number of structures which can be formed by a small piece of tissue.

In the simultaneous integration of a number of activities the cortex must present a large number of nodal points of excitation and it is possible that the number and distribution of these within the association areas is determined not by specific connections but by the polarization effects of the various localized excitations within the sensory projection fields. In such a case the number of nodes of excitation and of diverse gradient fields would be definitely limited by the factor of separation and of available mass of tissue.

I have indulged in this highly speculative discussion primarily to show that the notion of decentralization or of cerebral function without absolute anatomical localization need not involve an abandonment of recognized physiological principles or a denial of the known facts of localization. The chief advantage of the strict theories of localization has been their definiteness and comprehensibility. Those of us who have felt the inadequacy of such theories have had to fall back upon expressions like mass action, stress patterns, dynamic effects, melodies of movement, vigilance or nervous energy; all highly metaphorical and unproductive of experimental problems. Yet the facts demand something of this sort. The evidence seems conclusive that in various cortical functions there is every degree of specialization from a limited point-to-point correspondence of cells to a condition of absolute non-specificity. Not only is there diversity in the modes of action of different parts of the cortex but a single area, highly specialized and differentiated for one activity may be wholly undifferentiated with respect to another in which it also participates. We have not a choice between a theory of localization and a theory of decentralization, but must develop a wider view which recognizes the importance and interdependence of both modes of integration.

The principles to which I have appealed in the foregoing sketch, the production of gradients of activity and their influence upon organic processes, the development of stable patterns of interference in the transmission of different forces through a homogeneous matrix, are as well established in biological thought as are the principles of conduction within the nerve fiber or the interaction of nervous impulses within a spinal center. They will be capable of test with further improvement in our methods of studying the electrical phenomena of nerve conduction. Whether these specific suggestions prove right or wrong, they indicate, I believe, the direction to which we must turn our investigations, if we are to develop an adequate cerebral physiology.

OBITUARY

IGNATIUS URBAN

THE really capable and active systematic botanists of the world are so woefully few that the removal of a single one vacates a niche that usually remains unfilled. Such losses seem to have been more than normally frequent during the past year. In 1930 the world was deprived of Dr. Adolf Engler, dean of German botanists. Only a fortnight ago news was received of the death in Copenhagen of Dr. C. H. Ostenfeld. On January 7 the Botanical Garden and Museum of Berlin-Dahlem was robbed by death of another of its most brilliant men, Dr. Ignatius Urban.

Dr. Urban's special field was the flora of the West Indies, to which he devoted forty busy years. He found the Antillean flora in chaos, and left it in order. It is safe to say that for no other part of America is there available in convenient form so well ordered a mass of exact information as exists for the West Indian flora in the nine volumes of the "Symbolae Antillanae."

Those volumes by no means represent the whole extent of Dr. Urban's work, for he published many papers in German and Swedish journals. The "Symbolae" contain a vast amount of ably presented information regarding West Indian plants—descriptions of new species, monographs of genera and critical notes upon nomenclature, besides chapters upon botanical history and bibliography and plant geography. One of Dr. Urban's greatest services to science was his careful solution of the status of many vague names appearing in early literature but long neglected. He did more than any other man to place nomenclature of tropical American botany upon a solid and sane basis. His floras of Porto Rico and Hispaniola, which constitute two volumes of the "Symbolae," must be consulted almost daily by students of tropical plants.

Few botanists of all time have accomplished so much and that so uniformly well. Whoever consults Dr. Urban's own pages of the "Symbolae" will be

amazed at the wealth of painstaking detail, presented so lucidly and concisely. The descriptions of new species are models of accuracy and completeness such as scarcely a single botanist of the present generation can or will try to follow. In his ability to judge specific and generic values he had few peers. His conservative but nevertheless progressive and modern treatment of such units puts to shame the hasty and often irresponsible publications of many of his contemporaries in both Europe and America.

A fitting climax to Dr. Urban's life work was his study and description in recent years of the extraordinary collections made in Cuba and Hispaniola by Dr. Erik L. Ekman. It had been supposed by some botanists that the flora of the Antilles was practically exhausted, at least so far as discovery of new species was concerned, but Ekman's explorations showed the fallacy of such a supposition. His work in those islands revealed hundreds of new species and numerous genera quite as distinct as any ever described.

The study of these collections engaged happily Dr. Urban's youthful enthusiasm until the very time of his death. The voluminous reports upon them that have come so frequently from his pen during the last few years show that age had not abated his industry or dimmed his keen discrimination.

Dr. Urban may be envied for the fact that the end came with little warning, and that he was able to continue his habitual activity in the herbarium until the time of his death. As a friend writes, "Fortunate the man who can go in the midst of contentment, and without suffering."

American botanists who have visited Berlin will be saddened by the announcement of the death of Dr. Urban, for all of them speak of him with genuine affection and esteem. His courtesy and sympathy toward them were unaffected and unfailing.

The writer knew Dr. Urban only by his publications and through kindly letters received at all too infrequent intervals. Nevertheless, so vivid an impression of his personality did these leave that he always was felt to be an intimate friend of long acquaintance, and the news of his passing was received with a deep sense of personal loss. To the field of West Indian botany the loss is a catastrophe, for there is no promise of an adequate successor to the place which Dr. Urban held.

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ERIK L. EKMAN

SCARCELY had there been placed in the mail an obituary notice of Dr. Ignatius Urban, when there was received, through the kindness of Dr. R. Ciferri, an announcement of the death in the Dominican Republic on January 15 of Dr. Erik L. Ekman. Dr. Urban was so advanced in years that his loss was not altogether unexpected, but Ekman was only forty-six, and of such rugged and vigorous physique that many more years of his habitual restless activity might confidently have been expected for him.

Already trained by field work in South America, Ekman went to Cuba early in 1914, and devoted the rest of his life to an investigation of the plant life of that island and Hispaniola. Cuba, it was presumed, had been rather well explored by earlier collectors, local, European and North American, but his work proved that theirs had been far from thorough. In Hispaniola the situation was somewhat different. The island was explored botanically a century ago, but for long years afterward it was difficult to travel there. Ekman's tireless industry led him to every corner of Haiti and the Dominican Republic, to many spots which no foreigner ever had seen. He said to the writer on one occasion, "When I have finished with Haiti, it will be hard for any other collector ever to find a new species there." This boast he undoubtedly made good.

Happily, he was able to complete to his satisfaction his exploration of Hispaniola. At the time of his death he was on the point of sailing for Venezuela, where he could expect to surpass even what he had accomplished in the West Indies. What he already had done was a life work for any man. In both Cuba and Hispaniola he had discovered hundreds of fine new species, and many equally good genera, besides adding to their recorded floras scores of plants already known from elsewhere.

Ekman had as many eccentricities as characterize most other scientists. No one who met him ever could forget him. He attracted much comment in Haiti by his frugality, which was the result of the limited means at his disposal, his utter indifference to conventions and his complete absorption in his work. Would that other naturalists might emulate him in devoting more pages to science and fewer to food and weather! He was bluntly frank in speech, a consequence of his well-founded confidence in his own knowledge. He had a profound scorn for shabby and incompetent work. His specimens and his acquaintance with the plants from which they came left nothing to be desired.

The writer once had an opportunity of witnessing for a few hours the manner in which Ekman botanized. He covered a rocky hillside with the agility of a wild animal, and attacked it as if it were an adversary. Heat and storm and hardship of travel were for him beneath consideration. It was thus that he was able to explore the remotest and most difficult mountains, where others feared to go. His perfect acquaintance with every Haitian plant enabled him to recognize immediately any new one that he saw.

For that reason he shared with Dr. Urban author-