

knowledge upon the relation between the testes and the thymus, and the theories which had been formulated about this relation upon insufficient evidence.

Dr. Marshall next referred to the question of femininity and alluded to Steinach's experiments in which ovaries had been transplanted into previously castrated male guinea-pigs. Dr. Marshall agreed with Dr. Blair Bell that femininity cannot be defined merely by the presence of ovaries. Dr. Marshall stated that extirpation of ovaries in ewes belonging to a breed of sexually differentiated sheep did not lead to the assumption of male characters, but that, on the other hand, Goodale had described experiments in which the removal of the ovary in a duck was followed by the acquirement of male plumage.

Dr. Marshall concluded by an account of the functional correlation which exists between the corpora lutea and the uterus and mammary glands, and pointed out that a relationship of this character must have developed gradually in the course of evolution through the tissues of the organs acted upon becoming susceptible to stimulation by substances secreted by the activating organ, and that consequently we might expect a co-ordination of this kind to be present in a somewhat imperfect form in certain individuals.

Dr. T. R. ELLIOTT, F.R.S., urged that the general conclusions which thinkers on this new problem were endeavouring to establish should be received with much caution. The new knowledge was being sought along two lines of inquiry, that by clinical observation and that by animal experiment. Clinicians had done splendid work in recognizing types of disease that were associated with special changes in the ductless glands, and it was from them that the suggestion had been pressed as to the possibility of some essential relationship in function between the various glands. But to weave these observations into a system of precise knowledge was a difficult task, for the work of the clinician was perforce individual, both in respect of the patient and the observer; it was often bound to be hasty and imperfectly reasoned, because the patient must receive some diagnosis and treatment. Hence came the request for aid from the experimental method with animals, a method that could repeat its observations again and yet again, and delay the answer until completely confident of the right solution. Practical medicine must act at once, and therefore could always be forgiven a mistake. Scientific workers in the laboratory were granted time, a mistake with them was unpardonable, and they should not attempt to teach to Medicine until assured that they had found and proved the truth.

In this matter of the ductless glands and their relationship to the genital functions there was more speculation than sound knowledge abroad, and it was necessary to test all with a very open mind. On the clinical side good reasons could be given for believing in the probability of such a relationship, the arguments from morphological history supported the surmise, but Dr. Elliott thought that the evidence from animal experiments was as yet entirely indecisive. Nothing had been proved either for or against the theory. Impatient for the aid that was so long delayed, clinicians themselves, with an admirable enthusiasm, had entered the laboratories and attempted to win knowledge of the physiological laws that govern the phenomena of disease. But here they were especially handicapped by the clinical habit of mind, the desire for prompt diagnosis and action which led them to hasty conclusions and insecure generalizations. It was therefore especially necessary that their teaching should be tested critically by the pure physiologist and the pure pathologist, before it could be accepted by those concerned with the practice of medicine. Evidence had been collected in the last twenty years which proved beyond doubt that the medulla of the adrenal glands is essentially a part of the nervous system. Very crudely, this tissue might be regarded as a mass of secreting ganglion cells, belonging to the sympathetic nervous system, which had assumed a glandular function. For the cortex of the gland he could only say that there was no proof either that it was, or that it was not, connected with the function of the medulla.

The Viennese school had tried to show that other ductless glands were connected with other divisions of the nervous system, such as the thyroid with the vagus, and from the known antagonism between the vagus and the sympathetic, they deduced a like antagonism between pairs of ductless glands. This antagonism was absolutely unproven, all the known facts could be equally explained on the view that the glands are mutually adjuvant and enlarge to help each other's deficiencies. So too there was no shadow of proof that the glands, other than the adrenal medulla, are associated with special divisions of the nervous system. Indeed, if such were the case, it would be improbable that they would be related also to the genital functions, and the discussion of that evening would find its subject melting into thin air.

It was an amazing thing which Medicine had suggested, that gland cells at the base of the brain, on the front of the throat, close to the kidneys, and embedded in the substance of the genital organs, were all connected with one another and exerted a mysterious and combined

influence over growth and the reproductive functions. Experimentally it certainly was not proved, and he thought that almost all Dr. Blair Bell's observations were open to serious criticism which deprived them of the importance with which his zealous enthusiasm naturally invested them. But embryology and comparative morphology gave their support to this view. The interstitial fatty cells of the testis and the fat-laden cells of the adrenal cortex were derived from a common mass of tissue at the back of the abdomen, and vestiges of this were found through life in the fragments of adrenal cortex that may be strewn on the line from kidney to the descended sex gland. Animals below the vertebrates might possess in each segment a glandular mass of cells associated with the genital and excreting organs of each segment. Evolution caused the genital and excreting organs to disappear from most of the segments and be concentrated at a particular level. But the glandular masses tended to persist in their original wide serial distribution, in what a German might style a genito-excretory-growth-governing system. Gaskell's great theory traced their growth from the coxal glands of the arthropod to form the pituitary, the thyroid, and the adrenal cortex of the mammal. Fresh functions were assumed with the evolution of each gland; at the back of all doubtless rested the old power to influence growth and reproduction. But the adrenal medulla must be excluded from this possible series, and in consequence adrenalin was unlikely to be of use in the therapy of their disease.

Work in the next few years would have a fascinating tale to tell, when the history and dominion of these glands were fully known. Two chief temptations were liable to lead thinkers astray from that great goal. Any Sir Launcelot might, with but little blame, yield to the lure of the seductive theory and fall away from his honest allegiance to proved facts. The other was a less knightly fault, of the man who, in the phrase of Kipling, "Stinting the work half finished, for the instant meed of praise," asserted that proof had been given, where the proof was sadly short of completeness. The so-called literature of the ductless glands illustrated both these errors in abundance.

Mr. JAMES BERRY said that with regard to the relation between the thyroid gland and the female sexual functions, he felt that he was unable to draw any definite conclusions or to make any generalizations founded upon a sufficiently firm basis of fact. His ideas on the subject were still in a nebulous condition and he doubted, therefore, whether anything he could say would add much to the value of the