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Evolution And Heredity

Mutual Aid: A Factor Of Evolution by P. A. Kropotkin

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the lesions were verrucose. Fresh lesions, which were constantly appearing, were characteristic lichen planus papules, but there were no lesions of the mucous membranes. The exhibitor's views were generally accepted by the PRESIDENT, Dr. DORE, Dr. ADAMSON, and Dr. MACLEOD.

SECTION OF PSYCHIATRY.

At a clinico-anatomical meeting on April 28th, under the presidency of Dr. F. W. MOTT, Dr. ARMSTRONG JONES exhibited a number of cases of *Hypothyroidism*, a condition due to loss of function of the thyroid gland. Schiff described cases of this condition in 1859, Gull in the Sixties, Ord in 1880, and Kocher in 1883, and Sir G. Savage described it more than thirty years ago in *Tuke's Dictionary of Psychological Medicine*, and pointed out its association with mental disease. Dr. Mott made the relation of the ductless glands (thyroid, supra-renal, pituitary, ovaries, and testicles) the subject of his address last year. It was known that the condition *cachexia strumipriva*, allied in all respects to myxoedema, was induced in animals by removal of the thyroid gland, and that this could be prevented by transplanting the thyroid of an animal into the peritoneum. Baumann demonstrated that the nucleo-albumin of the gland contained a large percentage of iodine, and that the gland manufactured some thyro-antitoxin, and formed an internal secretion having the characteristics of an alkaloid. This substance acted as a hormone to other glands, while its absence was followed by physical and mental disturbance. Hypothyroidism caused an overgrowth of the subcutaneous tissue, the hands became unwieldy, the skin rough and harsh, and the hair disappeared or became sparse and wiry. On the mental side there were apathy, listlessness, and inactivity. Pawlow had shown how glandular secretions could be influenced by the emotions. In children, absence of the thyroid produced sporadic cretinism, and, possibly, idiocy of the Mongoloid type. In adults its absence eventuated in myxoedema. It was not by any means easy to recognize during life all cases of hypothyroidism, as some of the symptoms, such as tremor, seizures, and the mental reactions, were common to alcohol and general paralysis. Dr. M. KOJIMA stated the results of examination of the thyroid gland in 110 cases of mental disorder, with special reference to hypothyroidism. The minimum average weight of the thyroid in the non-insane was 22 to 25 grams. In the average insane person the weight was much less—namely, about 16½ grams in the male, 16.87 in the female; but there was considerable variation in the weights among the insane, especially in females. He considered that all these cases exhibited hypothyroidism. The weights of the external parathyroid in 41 cases varied from 0.01 cg. to 0.07 cg. In a third of the cases four glands were found. The weight of the pituitary body seemed to have no relation to the nutrition of the body or to the form and duration of the insanity. The adrenals of the male were heavier than those of the female, and there was no relation of their weight to that of the body. No definite conclusion could be arrived at regarding the weight of the reproductive glands in the male and female in relation to body weight or to mental disease, except that in congenital imbecility and dementia *præcox* the ductless glands were all below the average weight. The PRESIDENT gave a microscopical demonstration of the changes in the nervous system in hypothyroidism, and discussed the changes he had found in the nervous system in 6 cases of the condition. These chromolytic changes he first observed ten years ago, in a case of myxoedema which was under his care at Charing Cross Hospital. In the case of a woman whom Dr. Armstrong-Jones had sent for him to see there was anaemia, but the only signs of hypothyroidism present were slight dryness and harshness of skin, a malar flush, and slowness of speech. She showed marked confusion. She died shortly afterwards, and Dr. Mott examined the thyroid gland and nervous system. As similar changes seen in her had been since found also in three other asylum cases, the faults which had been described by Dr. Kojima might be regarded as established, seeing that these had now been found in six cases. The thyroid showed only a few remnants of glandular structure amid the lymphoid structure, and a large excess of fibrous tissue. The autonomic centres in the medulla were more affected than were the other cells,

but all the cells of the central nervous system and spinal ganglia, especially the small viscerovascular cells, exhibited some chromolytic change. The processes were but indistinctly seen and the nucleus was excentric. He specially wished to show the changes in the cortex so as to correlate the mental symptoms with the changes in the cortical cells; these he demonstrated by a series of slides. A section from the cardio-inhibitory centre in a typical case of myxoedema showed a peri-cellular chromatolysis in all the cells. Similar changes were seen in the glossopharyngeal nucleus and the psychomotor cortex. The cortical pyramidal cells had lost their position, and instead of lying in columns with the apical processes pointed upwards they were twisted from side to side. A superficial layer of the cortex stained with victorian blue showed a network of glial cells and a superficial felting in the cortex, owing to the extreme glial proliferation. A low-power slide showed that the columns of Meynert formed by the pyramidal cells and their processes were too indistinct to be recognized, their places being partly taken by nuclei of proliferated glial cells. In these cases there had been a change which led to the disappearance of the Nissl substance, which probably occurred on account of an alteration of the osmotic conditions of the cells, allowing water to pass in and swell the cell. If, as was supposed, this basophile substance was the kinetoplasm, this change constituted a physical reason for the slowness of speech and cerebration which these cases manifested. Dr. Mott also showed slides of ganglion cells in the living stage, as viewed with the dark-ground microscope; an enormous number of highly refractile granules were seen in the cell. The little granules of fluid were enclosed by a thin membrane which stained blue, and this formed the Nissl granules when death occurred. His view was that these granules formed an enormous oxygen surface, because if they were stained blue and placed in an atmosphere of nitrogen in a warm chamber, the colour disappeared; but on letting oxygen in, the colour returned. It would be important to be able to prove that the Nissl substance was the energy substance. For in hypothyroidism there was a definite lack of that substance, and it would account for the loss of mental capacity and of alertness of response observed in these patients. Dr. LENA BEACH exhibited and demonstrated a case of *Disseminated sclerosis*. Dr. SANO reported the result of his anatomical investigations regarding speech functions in a case in which there was a *Cyst of the left hemisphere*, dating from birth or shortly afterwards. The lesion had destroyed the whole of the centrum ovale on the left side; but, notwithstanding that, the man had been able to earn his living as a clerk. The cortex remained, but practically the whole of the projection system was destroyed.

Reviews.

EVOLUTION AND HEREDITY.

THE eight chapters of which Prince KROPOTKIN'S *Mutual Aid*¹ consists first appeared in the *Nineteenth Century* during the years 1890 to 1896. And now, twelve years after the work first appeared in book form, we have before us a popular edition procurable at the modest price of 1s. The author's intention can best be conveyed in his own words. "No naturalist," he admits, "will doubt that the idea of a struggle for life carried on through organic nature is the greatest generalization of our century. Life is struggle; and in that struggle the fittest survive. But the answers to the questions, 'By which arms is this struggle chiefly carried on?' and 'Who are the fittest in the struggle?' will widely differ according to the importance given to the two different aspects of the struggle: the direct one for food and safety among separate individuals and the struggle which Darwin described as 'metaphorical'—the struggle, very often collective, against adverse circumstances. No one will deny that there is, within each species, a certain amount of real competition for food—at least, at certain periods. But the question is whether competition is carried on to the extent admitted

¹ *Mutual Aid: A Factor of Evolution*. By P. A. Kropotkin. Popular edition. London: W. Heinemann. 1915. (Cr. 8vo, pp. 217 1s. net.)

by Darwin, or even by Wallace; and whether this competition has played in the evolution of the animal kingdom the part assigned to it." Prince Kropotkin is of opinion that the part played in evolution by what he calls with Darwin the "metaphorical" struggle—that is, the struggle of natural groups or species to resist adverse economic or climatic conditions—far surpasses that of the struggle against one another of separate members of such groups or species. Indeed, he is inclined to go much further, arguing that a careful study of Nature will show that the competition of individual members of a given species is more often hurtful than advantageous from an evolutionary point of view. "Combine—practise mutual aid!" That, he tells us, is Nature's true lesson; and the bulk of this work is composed of illustrations, many of a most striking character and not a few the result of his own observation, of the vast amount of spontaneous co-operation practised among wild animals of almost every kind as well as among savages, among barbarian races, in the cities of Europe during the Middle Ages, and in the present day among ourselves. We would call the attention of prospective readers—and every student of evolution should read this book—to the glowing account of the achievements of the mediæval guilds, which begins on page 158. We are of opinion that the book is of great scientific value, and that the author has proved up to the hilt his contention that, as an evolutionary factor, spontaneous co-operation has by no means yet received the consideration and appreciation that are its due. What seems to be needed now is a judicial comparison of the two factors—on the one hand, conflict and discipline, on the other, free and unrestricted co-operation—with a view to the appraisal of their mutual relation and specific value.

Students of heredity should not fail to read Mr. C. L. REDFIELD'S *Dynamic Evolution*,² which treats on novel lines one of the most vexed problems of that branch of biology—the transmission of acquired energy of a specialized kind. By an exhaustive scrutiny of the family histories and records of fast-trotting American horses the author arrives at the conclusion that, contrary to the breeders' tradition, the parental condition in regard to speed acquired or rather developed by training, reappears in the offspring. The apparent exceptions to this law are attributed to the fact that stallions are often trained in adolescence, and that speed so developed behaves as a sexual character and has no effect upon the racing qualities of daughters or gelding sons. This fact has, he thinks, prevented the detection by trainers of the inheritance of accumulated energy, which under all other circumstances he finds to be the rule. Of the thousands of foals begotten by forty-five sires whose records he investigated, only those sons got at dates very near the time when they retired from the track reached into the highest speed class. These conclusions the author supports by facts recorded as to the breeding of prize setters and the milk-producing capacity of Holstein-Friesian cows. In the concluding chapters the investigation is extended to human heredity, and facts are adduced to show that the kind and degree of ability is directly influenced by the age of the parents. The author also contends that, while the infant mortality of the offspring of somewhat aged parents is excessive, those of them who survive to twenty-five years are both longer lived and more intelligent than the children of younger parents.

That we live again in our children and in our children's children is no new discovery, but the truth of it has come home to Dr. MOONEY with such force that he endeavours to persuade others to share the consolation he finds in it for the sacrifice of what he considers the idle dream of a supermundane survival. *How You Live Again*³ is a brightly written little book, but its frank materialism has a somewhat belated air, the trend of thought being to-day in a contrary direction. There are those who will not agree that the continuity of the germ plasm, and the

possibility that some remote descendant may resemble one so closely as to be "practically the same individual," afford any solid ground for the conviction that death is swallowed up in victory.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

A NEW edition of Professor GLAISTER'S *Textbook of Medical Jurisprudence and Toxicology*⁴ has appeared, and the fact that a textbook has reached its third edition within about seven years from its original appearance silences adverse criticism, for the fact proves popularity and adaptation to public needs; nor are we surprised at the success of Professor Glaister's book. We may, perhaps, be allowed to state a little personal experience to explain our meaning. We began looking through the pages of the work with the object of writing this review, anticipating that probably an hour might suffice for appreciating its salient features; so absorbed and fascinated did we become that several hours had passed in its perusal before we appreciated that the review was still to be written. What attracted us? Perhaps in the first place the clearness and legibility of the type, a tribute to the care and attention of the publishers, but next, and of course essentially, the charm of Professor Glaister's diction. Never was it necessary to read a sentence twice to appreciate its meaning, for the author is not only master of his subject, but master of a style of composition which made it a pleasure to read his pages. When we put the book down we felt that every part of the field of forensic medicine had received an almost complete exposition—first, the basic principles of evidence, then the collection of facts to form the evidence, and then illustrations of evidence brought into court with all its strengths and weaknesses laid bare for the reader to form his own judgement upon it.

The first subject that attracted our attention was that of finger prints as a means of identification. This is frequently thought to be an extremely difficult and deeply technical subject—a feeling we have shared—but Professor Glaister's description, coupled with the illustrations, seemed to render it as simple as possible, and made one fancy that one could proceed straightaway to the detection of a criminal by this means. Probably this impression is wrong, and the inexperienced might make a sad bungle of the matter, but for all that, the point well illustrates Professor Glaister's gift of clear exposition.

On slowly passing over the section on wounds we found the illustrative cases so appositely chosen that we had read them without appreciating the passage of time. In the same section we read of a form of wound that was certainly new to us. Professor Glaister quotes it from an Italian source apparently; we mention the outlines in the hope that they may catch the eye of some one who can tell us of the possibility of such an event. A man, aged 64, was attempting to rape a girl, and she in defence caught his penis and forcibly pulled on it. It came away in the struggle. Biondi, from whom Glaister quotes, says that experiments proved this to be possible with the organ in a state of erection.

We might write much more in illustration of the excellence and completeness of the work. All we can say in detraction is that it strikes us as too much for a student to absorb; still, it is so easy to read that perhaps a student might read it like a novel and so retain enough for his purposes on the principle of "throwing mud enough."

The medico-legal aspects of our profession are very much to the fore since legislation has been very active in measures dealing with social problems. Dr. BREND has been extremely active in his endeavours to give students and practitioners a clear idea of these same aspects, and we think that in his *Handbook of Medical Jurisprudence and Toxicology*⁵ he has made a most successful effort. The diction and phraseology in which he has clothed his ideas are remarkably pleasant to read, although his publishers have compressed them into a comparatively small space. So much do we feel this that the question inevitably arises whether it is worth while to write large books on the subject. We have made

⁴ *A Textbook of Medical Jurisprudence and Toxicology*. By J. Glaister, M.D., D.P.H.Camb., F.R.S.E. Third edition. Edinburgh: E. and S. Livingstone. 1915. (Demy 8vo, pp. 872; 138 figures. 45s. net.)

⁵ *A Handbook of Medical Jurisprudence and Toxicology for the Use of Students and Practitioners*. By W. A. Brend, M.A.Cantab., M.B., B.Sc.Lond., of the Inner Temple, Barrister-at-Law. Second edition, revised. London: C. Griffin. 1915. (Fcap. 8vo, pp. 321. 8s. 6d.)

² *Dynamic Evolution: a Study of the Course of Evolution and Degeneracy*. By C. L. Redfield. New York and London: G. P. Putnam's Sons. The Knickerbocker Press. 1914. (Cr. 8vo, pp. 220. 6s. net.)

³ *How You Live Again*. By J. Mooney, M.B. Manchester: The Pons Press. 1915. (Post 8vo, pp. 149. 5s. net.)