The pathology and treatment of Graves's disease / by W.H. Thomson.

Contributors

Thomson, William Hanna, 1833-1918.
Maude, Arthur
Royal College of Surgeons of England

Publication/Creation

New York : [publisher not identified], 1893.

Persistent URL

https://wellcomecollection.org/works/npccth3y

Provider

Royal College of Surgeons

License and attribution

This material has been provided by This material has been provided by The Royal College of Surgeons of England. The original may be consulted at The Royal College of Surgeons of England. where the originals may be consulted. This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.

wellcome collection

Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
https://wellcomecollection.org

Bibliog- Cit digest.

Original Communications.

THE PATHOLOGY AND TREATMENT OF GRAVES'S DISEASE.*

BY W. H. THOMSON, M. D.,

PROFESSOR OF MATERIA MEDICA AND OF NERVOUS DISEASES, UNIVERSITY OF THE CITY OF NEW YORK; PHYSICIAN TO BELLEVUE AND ROOSEVELT HOSPITALS.

THE progress of pathology often illustrates the disadvantage of the premature naming of diseases after some of their common or prominent symptoms, for further knowledge may show the disease to have much wider relationships than at first suspected, and in some cases to exist without these symptoms being present. If such be the case, the symptomatic name may then operate to prevent a correct diagnosis. Locomotor ataxia is a good example of the concealing power of such names, for I have known of an elaborate diagnosis being made of a tumor in the optic thalamus to account for the optic atrophy of a tabetic patient who, though wholly blind, yet had no ataxic gait, while in other patients with this disease the significance of pains or of gastric crises has been similarly misinterpreted, because the motor symptoms were so little developed. In like manner the name exophthalmic goitre has had much the same influence in preventing the recognition of Graves's disease in many instances, and still more in confusing the views of its pathology. In reading the numerous contributions on the pathology of this interesting affection, it is striking to note how predominantly the conception of some textural lesion in the nervous system that would account for the exophthalmia and the goitre has directed either the investigation or the speculation, in seeming forgetfulness of the fact that these symptoms are not essential to the affection, because they may be both present with Graves's disease absent, or both absent with Graves's disease present.

The safest rule to follow in pathological problems is to seek first for the most constant characteristics of a given complaint, rather than for the most obtrusive ones, for, when the latter are found to be wanting in some real cases of a given affection, they sink at once from the rank of a primary to that of an accessory relationship to its true pathology. Having found the most constant characteristic of the disease, we must even then keep to what is most constant about the characteristic itself when we come to analyze it, lest we be again turned aside from the right course by non-essential accompaniments. Thus the most uniform condition in Graves's disease is what may be correctly described as a state of marked agitation. In many instances it is for long a purely physical state, not involving the mind or the spirits, and yet the patient acts as if greatly alarmed about something. This has led many writers to pronounce fright to be a leading *cause* of the disease, and how far this hypothesis may be pushed is illustrated by Dr. Hector W. Mackenzie, in his excellent lectures on Graves's disease (*Lancet*, September, 1890), when he sums up its pathology by saying that if we can not show in each case that the patients themselves have so started from a fright, yet some of their ancestors may once on a time have been greatly terrified, and thus laid the foundation for Graves's disease in a descendant by what he terms an unconscious hereditary memory. We are thus at the outset diverted from the study of a truly characteristic condition to that of a most occasional element in the clinical history of the affection, and which is then made to do duty as a guide to its true pathology. The parallel instance of chorea, where fright is so often spoken of as a cause of the disease, naturally suggests the desirability of a new technical meaning of the term "cause" in medicine. It would be a great gain to restrict its use only to some element, discovered or to be discovered, in the ætiology of a disease without whose presence the disease would not exist, while for all variable factors to employ some such term as occasion. Thus fright may be the occasion of the first manifestation of chorea or of Graves's disease, a blow the occasion of the development of a mammary cancer, a chill from exposure to cold the occasion for the development of a croupous pneumonia or of a pulmonary phthisis, but it is only a hindrance to our progress toward a correct pathology of either of these diseases to put down any one of the very varying occasions of its first manifestation as its cause. It would be better to defer rating anything that is occasional in a disease until its proper and quite subordinate place is settled by the due precedence being determined of the few constant over the many occasional elements. This is particularly the case with such a convenient cause to allege as fright in nervous patients, for not infrequently it may prove on examination that the patients had been for months in a state of true physical agitation before the accident of a mental impression occurred which they describe. In my last eight consecutive cases of Graves's disease in private practice not one of them would ascribe the initiation of the complaint either to fright or to any other emotional cause. Of course it is impossible to say what may have happened to their ancestors, but I think that a much nearer source of their bodily agitation may be found in their present living frames than in the dead past.

The first of the above-mentioned patients presented at her first visit a complete picture of the constant, in distinction from the occasional, symptoms of Graves's disease. I had known her well for some time, from having attended other members of her family, but she had always been healthy before, so that I had not seen her for some months. She showed no sign of either exophthalmia or goitre, but, as she now began her story, she seemed as if about hesitatingly to divulge some great cause of mental distress. Her voice trembled as if choked with emotion, her hands trembled, and her respiration was hurried and catching. She said, however, that she had had nothing to make her so nervous, nor could she imagine why she was so, except that she had had diarrhœa all summer, but that other people had diarrhœa without being as nervous as she was. As soon as I examined her pulse, which was over 140, with a normal temperature, and noted that the muscular tremor was so extensive, I felt assured that she had Graves's disease, though

* Read before the New York Neurological Society, March 17, 1893.

it was not till long afterward that she showed any enlargement of the thyreoid, and never up to her death from this disease, three years afterward, did she show any exophthalmia.

The second and third patients were sisters, the second a young unmarried woman with very rapid action of the heart and considerable enlargement of the thyreoid, but no exophthalmia. She entirely recovered. Her sister was married and some fifteen years older. She had no marked goitre and but a very slight exophthalmia, but she had rapid heart action, with very extensive throbbing of the arteries, and complained of frequent abdominal pains. She quite recovered for four years and then had a relapse, from which she has again improved. Both these patients had suffered from rheumatism, and the elder had a permanent hip lameness from it. They were both poor and hard-worked, but otherwise had no cause of mental depression or shock.

The fourth patient found her nervousness a mystery to her. She had naturally a lively disposition and she had contracted a fortunate marriage, so that she felt contented with everything in her life, when without apparent reason she became unaccountably nervous. She developed goitre and exophthalmia very rapidly, and with von Graefe's symptoms very distinct, and she became both anæmic and emaciated. The heart's action was violent and accompanied by loud systolic murmurs at the base and apex. After a year of most serious symptoms she gradually improved and is now in a fair state of health, with but moderate exophthalmia or goitre.

The fifth patient, a very accomplished lady and a happy wife and mother, came complaining that she lacked the repose of strength. She is a prominent advocate of the rights of women, and hence felt humiliated at finding herself turning into a weak, trembling, nervous creature. She had enlargement of the right side of the thyreoid, but no exophthalmia on either side. She had suffered from both rheumatism and chorea in childhood, and has now two children—daughters—who are beginning with choreic symptoms. Under treatment she wholly recovered.

The sixth case was peculiar in that the symptoms first developed when the patient was about sixty-five years of age. She had thyreoid enlargement and was subject to suffocative nocturnal attacks like laryngeal crises. She had rather persistent albumenuria for six months, and during the course of Graves's disease she was extremely nervous and much troubled with insomnia. She wholly recovered for four years from all her symptoms, finally dying from pneumonia during the epidemic of influenza of April, 1891, at the age of seventy-four. She had a marked family history of rheumatism.

This lady, however, had a daughter, now about thirty-five years of age, who, after some years of delicate health, began to show a uniform enlargement of the uterus, which in about two years continued to increase until it reached the umbilicus. My friend Dr. Robert Watts examined her with me and pronounced it a myxomatous hypertrophy of the uterus, similar to a case which we both had together in the Roosevelt Hospital some years before, and in which afterward the late Dr. Peaslee performed hysterectomy at the Woman's Hospital. The interest of the present case is that, without any other symptom of myxœdema, she has gradually become very enfeebled in mind, and presents an appearance of pseudo-exophthalmia, due to emaciation without retraction of the eyeballs. She has frequent movements of the lower jaw of a choreic character. Her pulse is slow and weak and her general condition the reverse of Graves's disease, as she is listless and apathetic. The thyreoid gland seems to be wholly atrophied. Her case is interesting as one of cachexia thyreoidopriva in the daughter, with Graves's disease in the mother.

The seventh case of Graves's disease is that of a young married lady who developed goitre without an exophthalmia and with rather severe tachycardia. She improved, but had not recovered, when she became pregnant. This did not seem to affect the disease one way or the other. She gave birth to a child at term, but it lived only a few hours. She is now, at the expiration of a year, improved, but not fully restored. No mental shock of any kind had ever occurred to this patient, who, on the contrary, is of a very equable temperament, without nervousness, so to speak, in spite of persistent palpitation.

The eighth patient, a married lady aged forty-four, I saw in consultation with Dr. Emil Mayer, of this city, into whose care she had come after suffering for eighteen months with lancinating pains in both legs, persistent headaches, insomnia, and muscular tremors; then persistent diarrhœa with emaciation, losing forty-eight pounds in weight, with progressive weakness till she could not leave her bed. Meantime her heart action was 140 and there was general arterial throbbing. Various diagnoses had been made in her case, including general tuberculosis, but because she presented no sign of either goitre or of exophthalmia, Graves's disease had not been suspected. I diagnosticated her case as such, and under the treatment for that affection, including galvanism, her diarrhœa soon stopped and her improvement was progressive, so that on seeing her two months ago she had regained her flesh and color and her pulse was 70.

Now, in neither one of these eight cases was fright or any other emotion an element of the clinical history. With the exception of the two sisters mentioned, they were, on the contrary, more than usually free from causes of mental strain or depression in their life environment or experience, and so far, therefore, they indicate that mental factors are accidental rather than essential elements in the ætiology of the complaint.

Of these eight cases, both exophthalmia and goitre were wholly absent in one. Exophthalmia alone was absent in five. Goitre was absent in one, and was present slightly and only late in the disease, just before death, in one. Both exophthalmia and goitre were marked only in one. But in all there was the same pronounced tachycardia and muscular tremor, and in each there was emaciation—moderate in five and very pronounced in three. In four, imperfect inspiratory power was noted, but not so particularly as I shall look for it hereafter after reading Dr. Louise Fiske Bryson's observations of this symptom in Graves's disease.

I have chosen these eight cases from my private practice notes because they sufficiently illustrate the familiar features of the disease which I wish to dwell upon as most related to its pathology. One peculiar case I will only further mention, that of a patient who was sent to me by her physician four months ago, and who presented remarkable aneurysmal dilatations of the systemic arteries. There were several on the radial and on the right external carotid. The story was that they were transient in character. She had suffered a great deal from palpitation and tachycardia, but had no goitre or exophthalmia. Shortly after her visit she died suddenly with symptoms of hemiplegia.

The fact, therefore, that Graves's disease may exist even in a fatal degree of severity, as illustrated by the first patient in my list, without either exophthalmia or goitre, should be emphasized from the liability to the disease not

being diagnosticated, owing to the absence of these symptoms, as actually occurred in the case of the eighth patient. The enlargement of the thyreoid is mentioned by all writers as very variable in degree and in duration, even in the same patient, and it is equally noted that the rapid action of the heart often both precedes the goitre and persists after its subsidence, it and the muscular tremor being the first symptoms to develop and the last to disappear, and together constituting the most invariable elements of the disease. Our attention, therefore, should be particularly directed to them as the most related to its pathology, and, moreover, the most important practically, as the earlier the recognition of the disease the better for its treatment. As to pathology, a paralytic lesion involving the common nucleus of the glossopharyngeal, vagus, and spinal accessory nerves, and extending to the neighboring vaso-motor center in the medulla oblongata, would account for the whole group of symptoms which make up the picture of Graves's disease. In the first place, it should be noted that simple irritation of the lower branches of the glossopharyngeal and of the superior laryngeal nerves is sometimes accompanied by general muscular tremor. I once saw this amusingly illustrated by a stalwart young German butcher who came into my office trembling like a leaf because he had a fish bone stuck in his throat. He said in a husky voice that he was not frightened, but that he could not help shaking. With the laryngoscope I saw the bone directly across the chink of the glottis, and as soon as it was removed his shaking stopped. In experimental thyreoidectomy on monkeys and dogs the commonest immediate result is stated to be general muscular tremor, which lasts for many weeks. I regard this symptom as the direct effect of injury to branches of the superior and recurrent laryngeal nerves, which, according to Lindemann, are the only nerves which supply the thyreoid, rather than due to the effects of the removal of the gland itself upon the blood, for the tremor is much too immediate upon the operation to be so explained.

Now, such a bulbar lesion as we have supposed would also produce the other great constant feature of Graves's disease—namely, the tachycardia and the universal relaxation and throbbing of the systemic arteries. It would also explain the interference with the inspiratory expansion. It would not account, however, for the mechanism of the exophthalmia or of the goitre, though for the latter condition we have another cause to be mentioned presently. When we turn to pathological anatomy, however, we have no constant evidence of any textural lesion in the medulla, whether of the above-mentioned centers or of other parts. The experiments of Filehne, recently repeated with confirmatory results by Seeligmüller and by Bienfait, in which lesions of the restiform body produced increased pulse-rate and corresponding unilateral exophthalmia with muscular tremors, are open to the objection that it is difficult to perform such experiments without affecting contiguous bulbar centers. On the other hand, autopsies after Graves's disease have not shown any constant distinctive changes in the restiform bodies any more than in the cervical sympathetic, which was once supposed to be the anatomical seat of the affection. These theories, moreover, share in common the objection that the enlargement of the thyreoid and the exophthalmia are supposed to be the chief elements of the disease, which, as we have seen, is quite incorrect.

As pathological anatomy, therefore, has so far not revealed any truly characteristic change which can be causally associated with the genesis of Graves's disease, the question arises whether we can look elsewhere than to the nervous system for the *fons et origo* of the malady. Here I think that clinical experience may afford some significant intimations.

In the case of the first patient above mentioned I tried a great variety of remedies which I found recommended as serviceable in the treatment of this complaint. Belladonna, arsenic, nitrate of silver, the bromides, digitalis, and the iodides were prescribed in succession, without satisfactory results. The diarrhœa continued for many weeks unchecked by astringents, and the emaciation increased, with the rapid pulse and excessive nervousness and insomnia. At last I prescribed a complete change of diet, and ordered that the patient, who was now confined to her bed by her weakness and tremor, should be fed exclusively with matzoon and stale bread. The change for the better upon this diet was surprisingly rapid and progressive. The diarrhœa stopped without medicines, both her nervousness and sleeplessness improved, and finally the pulse became remarkably lessened. Iron then seemingly began to improve her anæmia, when before it appeared to aggravate her symptoms, and in the course of two months she seemed to be getting quite well. After four months she had so much improved that, contrary to my advice, she discontinued the matzoon and began to resume a meat diet, for which she was always very fond. Two months after this, on her return from the country, I found that all her former symptoms had recurred, including the diarrhœa. She again was put on matzoon and again she improved, and this time she continued the milk for about six months, with such a gain in flesh and color that she felt that she was well. She then went back to her ordinary diet, and I did not hear from her for some time, when I was called, to find her now worse than ever, because of the development of mental symptoms of both irritability and obstinacy which she had not shown before. She declared that she would rather die than take the matzoon, and nothing would persuade her to try milk in any form. One day I was sent for to see her because she seemed to be so low. I found her pulse to be with difficulty countable, and she was in a state of delirium with hallucinations. While I had my finger on the pulse, trying again to count it, it suddenly stopped, her pupils dilated, and the patient was dead with scarce a perceptible struggle.

Now, in this case a change of diet effected what drugs had quite failed to do; and then a first return to a meat diet brought back a return of the disease; then to be again and unmistakably arrested by discontinuing meat and resuming milk; and, lastly, a second return to meat brought back a fatal return of the disorder. This case has led me ever since that date (1880) to rely mainly on the dietetic treatment of Graves's disease, with such favorable results, both in hospital and private practice, that I have now little doubt that a specific disorder of intestinal, in distinction from gastric, digestion is a primary factor in the genesis of this affection. It is, of course, a familiar fact that diet has much to do with the therapeutics of functional nervous diseases, but until within recent years our practice in this

respect has been based wholly upon empirical grounds. In such an instance as this, however, it is difficult not to infer a causal relation between the food taken and the resultant symptoms. The meat diet seemed to be not only a contributing but a direct cause of diarrhœa, tremor, and rapid heart action—as direct as we find in any other seemingly immediate connection.

That we have now more than empirical grounds for inferences about the relation of auto-infection to the genesis of many of the derangements of functional nervous diseases is as well settled as any of the recent advances of pathology. In the processes of normal intestinal digestion it is claimed, on apparently well-ascertained facts, that the healthy system is constantly producing organic poisons, which are as capable of causing injury as any of the products of retrogressive metabolism in the body at large. We may therefore have specific disturbances occur from these organic poisons in either of two ways: First, by their excessive generation, or, secondly, by a failure in the normal functions of the body which are protective against them, from deficiency in the protecting functions of the organs themselves, or from a greater virulence in the poison generated than they can counteract. An effect from diet, therefore, in nervous disorders, one way or the other, would be explicable on chemical principles rather than on nervous textural changes, and, from my experience in the treatment of functional nervous diseases, I am becoming more and more persuaded that we have in this direction greater promise of progress, both in theory and in practice, than in hypotheses of irritative nervous lesions as the source of many functional disorders, Graves's disease included. On this point Dr. Fagge well remarks: "Some writers have endeavored to account for all the phenomena of the [Graves's] disease on a theory of irritation. But it is a sufficient objection to such a view that a primary irritation of a nerve center, lasting for months or years unchanged, is as yet unknown to pathology."

On the other hand we may say that, while a structural lesion in the medulla which would account for the phenomena of Graves's disease is almost inconceivable without its sooner or later involving all the vital functions of that seat of life, yet particular functional derangements produced by toxic agents are just what might be expected, for nothing is more characteristic than the narrowly selective operation of functional nervous poisons, which may go on for years, as in the case of opium, affecting certain functions without producing either progressive changes in them or extension to other functions.

The chief hindrance to committing ourselves to the toxic in distinction from the structural ætiology of such diseases is the considerable change which it involves in our views of the pathology of functional nervous diseases in general. It seems to offer too tempting, because too easy, a solution of many of the most obscure problems of practical medicine. That its advocates are often carried away by its far-reaching conclusions is undeniable, and many of their deductions are open to criticism on the score both of haste and of hobby-riding. But just the same may be said of bacteriology—namely, that it is too much like a blazing comet passing through the medical sky, with a nucleus of fact surrounded by a cloud of seemingly mere gas, carrying a tail of still more tenuous inferences stretching out to infinity. We need not, however, surrender our nucleus of facts, nor legitimate inferences based upon them, because everything can not be demonstrated at once in a newly discovered field.

Certainly there is one fact in Graves's disease which points much more distinctly to a digestive disorder than to a structural nervous lesion, and that is its occurrence in women about ten times as often as in men. We can hardly imagine that this difference is due to a difference in the medulla between the two sexes. That the digestive apparatus in women, however, is subject to special disorders is notorious. Many years ago I published in the *Transactions of the Medical Society of the State of New York* the case of a girl who, after a suppression of the menses from a wetting in a thunder shower, had first an obstinate constipation, which was attributed by the late Dr. White, Professor of Obstetrics in Buffalo, and for a time also in Bellevue Hospital Medical College, to intestinal obstruction, as she had developed stercoraceous vomiting. In the further progress of her case, however, her bowels were made to act, but the dejecta showed a total absence of coloring matter. She then had sudden suppression of urine, which was soon followed by profuse salivation and lacrymation, but which stopped after five days, when the kidneys started secretion again, and this alternation between the flow from the bladder and from the mouth continued at intervals till her death, about three months after the beginning of her affection. Such a case, however, only illustrates in an extreme way what derangements in the secretions and in the chemistry of the products of the blood-making and of the blood-purifying glands can take place from nervous disorders in the splanchnic system of women, and hence renders the surmise probable that if auto-infection from the intestine can take place at all, it may be looked for in women with special frequency. I may mention, therefore, in this connection, that I have not yet seen a case of severe Graves's disease in which diarrhœa was not sooner or later a prominent symptom.

On the other hand, it may be asked, if the symptoms of Graves's disease are to be ascribed to toxic infection of the blood by intestinal poisons, what relation has that fact to the common implication of the thyreoid in this affection? To this it may be replied that the facts of both sporadic myxœdema and the cachexia following thyreoidectomy, in both man and in animals, point much more to a metabolic function of the thyreoid than to a secreting one. It may be questioned whether such be not the main function of the ductless blood glands—that is, that they produce changes in the blood passing through them that may free the blood of otherwise toxic products, rather than that they add particular secretions of their own to it. The interesting experiments of Grützner seem to support this conclusion as regards the thyreoid, for he found that the blood of an animal from which the thyreoid had been removed, when injected into the veins of another animal, caused symptoms in it similar to those observed by Kocher in operative myxœdema in man.

The phenomena of Graves's disease, however, are those of excessive action of the thyreoid, rather than those of the contrasting symptoms of thyreoid atrophy; as if the gland were overstimulated by some ingredient in the blood which it can not sufficiently neutralize, for it is noticeable that the thyreoid is found in many cases not so much diseased after death as that its proper tissue is apparently hypertrophied. Certainly it often seems so to act in these patients during life, presenting a variation in bulk which causes it to resemble an erectile tissue in its alternate enlargement and subsidence, so different from endemic or ordinary goitre. This appears to me a much more probable explanation than the view of Chevalier, who ascribes Graves's disease to an intoxication of the nervous system by products of the thyreoid, because it is rather removal or atrophy of the thyreoid which is most constantly followed by signs of an intoxication due to the absence of its preservative functions.

As to the relation of a meat diet to disorders of the thyreoid, I will only cite for what they are worth some references to published observations. L. Breisacher, of Leipsic, finds that meat and meat extractives exert a poisonous influence on dogs after thyreoidectomy. Ewald and Rockwell are quoted in Sajous's *Annual of the Universal Medical Sciences*, 1891, as finding the removal of the thyreoid in pigeons to exert no perceptible influence on their health. They chose pigeons as pure vegetable feeders, to corroborate the earlier observations of Ewald, in which he ascribed the difference in the effects of thyreoidectomy between dogs and rabbits to the difference in their diet. Charcot, in his lectures on Graves's disease, lays special stress on the benefit to be derived from a milk diet.

Now that examination of the urine includes so much more than tests for albumin or sugar or the proportion of urea, there is much to be hoped for in researches of its composition in cases of functional nervous diseases. The chemistry of the urine, however, is evidently not an easy subject either in health or in disease. The existence of alkaloidal poisons in it is very variously reported, but meantime there is no reason to be incredulous that much light is yet to be thrown upon the relation of toxic ingredients in this secretion to the clinical facts of a great variety of morbid conditions. As regards Graves's disease, I find a reference in Sajous's *Annual*, 1892, to researches by Boinet and Silbert, reported in the *Marseille médical*, who profess to have found three principal varieties of ptomaines in the urine of a case of exophthalmic goitre. One possesses a convulsive action and produces arrhythmia, weakens the systole and arrest of the heart in diastole, while another causes a primary increase in systolic energy and afterward enfeeblement and arrest in diastole. Such observations, however, of urinary ptomaines in disease are not yet sufficiently uniform or distinctive to claim much authority.

My treatment of Graves's disease is mainly based upon its supposed relation to digestive disorders. In the first place, it seems to me that a meat diet is to be as much restricted in these patients as a starchy diet in diabetics. Fresh, undiluted milk also is, in my experience, not to be allowed, from its indigestibility with most healthy adults. It is a significant fact that races like the Tartars, the Bedouins, and the Guachos of South America, who have to live upon milk, have all found by experience that it has to be fermented first before it can become a staple and, as with them, about their only daily diet. All the world over the ferment for this purpose is the same—namely, the yeast plant. With fresh, good milk fermented every day, as it is by the Arabs and the peoples of western Asia, and now sold here pretty extensively under the Turkish name of matzoon, I have relieved more cases of vomiting from organic diseases of the stomach than by any other one article. In Graves's disease it has in my experience, as above mentioned, proved especially beneficial.

Medicinally, I think it is well to begin treatment by a mercurial purgative, as the ordinary blue pill, to be repeated occasionally from time to time. In some patients this will be found particularly useful against the diarrhœa. Then, three or four times a day, I prescribe in capsule five grains of equal parts of bismuth subcarbonate and powdered calumba, with four grains of salol and five of benzoate of sodium; or capsules of ten grains of bismuth salicylate with two of β-naphthol and two of ichthyol. The best time for these intestinal antiseptics to be taken is an hour after meals.

As a vaso-motor tonic, I now rely chiefly on ten-drop doses of tincture of strophanthus half an hour before meals.

SMALL-POX

AND THE VALUE OF VACCINATION AS A PREVENTIVE.*

By PEDRO JOSÉ SALICRUP, M. D.,

EX-MEMBER OF THE ROYAL SUBLEGATION OF THE BOARD OF HEALTH OF PUERTO RICO.

The disease which constitutes the subject of my paper this evening has lost a great deal of its importance in this country by the persistent and careful practice of vaccination, made compulsory by law.

In spite of this, however, the disease makes its occasional appearance among the inhabitants of the crowded tenement-house districts, generally imported by emigrants from other countries. But the cases that occur are, as a rule, of the modified or mild variety of the disorder. In this city, as in many others in this country and in Europe, where they possess a well-organized board of health with ample means for the isolation of cases and disinfection, the epidemics are checked at the outset by the prompt and efficient measures adopted by the said boards. This is not, however, the case in many other countries where vaccination is not so generally and carefully practiced, sanitary measures are not properly enforced, and means of isolation and disinfection are deficient or altogether wanting, where the disease continues to be a dreadful scourge, carrying away many victims and leaving many others more or less injured and marked for life with its periodical ravages.

This is especially the case in tropical countries where people belonging to colored races are abundant, for whom this disease seems to have an especial predilection, and

* Read before the New York County Medical Association, April 17, 1893.

who are generally very careless about cleanliness and sanitary measures and much prejudiced against vaccination.

In one of these countries (Puerto Rico) I have practiced medicine for twenty-two years; there I made my first acquaintance with the disease, in the treatment of which I have had a rather extensive experience. I have also in my capacity of public vaccinator, which office I held there for many years, practiced vaccination extensively by direct inoculation with bovine and humanized vaccine virus, and from arm to arm, and can testify to the beneficial effects of this operation in the shortening of epidemics and rendering subsequent ones less severe, especially since the facilities for obtaining pure and reliable vaccine virus have been increased by the foundation of an institute for the cultivation of bovine vaccine virus to supply the country.

I am sorry, Mr. President, not to be able to produce some statistics which would prove my assertion and make this paper interesting, but I could not procure them in the short time at my disposal to prepare this paper.

I do not pretend to bring to your notice in this paper any new facts in connection with the disease, but simply to call your attention to the severity which its epidemics still have in many countries, especially the West Indies, and to make a plea to bacteriologists and workers in the field of infectious diseases in favor of research and investigation of the causes and pathogenesis of this disease, which has been little attended to, with the object of finding, if possible, a more efficient measure to prevent its occurrence, either by devising other means of producing immunity from it or devising new means of treatment in man, or by improving the present measure of preventive inoculation, "vaccination," having more extensive and precise knowledge of the germ which causes it, and its habits and peculiarities, as is the case in other diseases of the kind.

The history of small-pox dates from very far back. It is said to have existed as a scourge in China and Hindostan one thousand years before the birth of Christ, and to have made its way through Arabia and Egypt into Europe, where it was introduced by the crusaders. It was unknown on this continent before the arrival of the European conquerors and new settlers, who imported it into this and other newly discovered lands. It was a much-dreaded scourge all over the world until the wonderful discovery of Jenner in 1796 came to deprive it of a great deal of its horrible and deadly character in countries where this operation is regularly and persistently practiced. The discovery of Jenner was met by a great opposition at the beginning among a number of practitioners and lay people, and even at the present time organized anti-vaccination societies are in existence in England and other countries to attest what prejudice and ignorance can do even with the most useful and successful discoveries in our art.

I will not tire you by giving a minute and elaborate description of the disease, its clinical history, etc. I will simply make a hurried sketch of the disorder, its varieties, and different stages, making some remarks on its complications, sequelæ, and treatment, with reference to my experience with it in the different epidemics which I have observed in Puerto Rico.

Small-pox or variola is a contagious and infectious disease of the blood, characterized by a peculiar eruption of the skin and inflammation of the mucous membranes of the body, accompanied by fever.

According to the present views, like all other infectious diseases, it ought to be caused by the introduction into the body of some kind of microbe or germ which, by its presence in the blood, produces the poison, toxalbumin or toxine, which gives rise to the grave symptoms and general dyscrasia of the blood sometimes observed. But so far bacteriologists have not found any special germ, and only the common pus coccus has been found in the pustules.

The first cases of variola that appear in a locality can always be traced to contagion if properly investigated, and the disease has always a tendency to spread as an epidemic if not promptly checked by appropriate means.

It is often preceded by other exanthemata, especially measles, and whether there is any relation between the agents causing these diseases or whether it is owing merely to the epoch of the year at which they occur being favorable for their development in the human system, I am not prepared to say. As to its primitive origin, some authorities believe that it first originated in the horse and cattle and from thence was acquired by man, and others hold the opposite view. Variola is most conveniently divided, in regard to its severity, into *benignant*, *malignant*, and *modified;* as regards distribution of the eruption, into *discrete*, *semi-confluent*, *confluent*, and *corymbose* or clustered.

The course of the disease is generally divided into five periods or stages, which indicate the different phases which the disease assumes before its termination, as follows: *Incubation*, *invasion* or *primary fever*, *eruption*, *secondary* or *suppurative fever*, and *incrustation* and *decrustation* or *desquamation*.

In the modified variety all these stages are not perfectly developed, and so we will take a typical case of true variola for our description. The period of *incubation* includes the space of time which intervenes between exposure to the affection or contagion and *invasion* of the disease. This period may be shorter or longer according to the severity of the case to follow, but the limit generally assigned to it by most authorities is from five to twenty days. There are no appreciable symptoms in this stage.

The period of *invasion*, or primary fever, is marked by symptoms which indicate serious constitutional disturbance. It commences with lassitude, chills, pains of the head, loins, and limbs, and hot skin. Conjunctivæ suffused; rapid pulse and respiration. There are thirst and loss of appetite, with a white and coated tongue, dotted with red papillæ, nausea, and often vomiting, constipation, pain and heat in the epigastrium, restlessness, and general prostration. To this may follow oppression of breathing, cough, lethargy, and in some cases delirium and coma. The tongue, which at the beginning of this stage was white, becomes red, the change beginning at the point and extending subsequently over its whole surface. In children convulsions frequently occur. There is an exacerbation of febrile symptoms to-