

Description of two New Algoid Vegetations, one of which appears to be the Specific Cause of Syphilis, and the other of Gonorrhoea*).

By

J. H. Salisbury, B. N. S. A. M. M. D.

Hierzu Tafel I, Figur III, 1—16.

I. Syphilis. The specific cause of syphilis attacks especially those histological elements, the characteristic, proximate, organic principle of which is either gelatine, osteine, or chondrin. These are connective tissue proper, bone, and cartilage. It first attacks the connective tissue at the points of inoculation, and next the connective tissue of the lymphatic glands, in the vicinity of the primary lesion. After the primary sore or sores have healed, the specific cause may remain, apparently, dormant in the system, for from a few days to some months, or even years. It may then show itself in blotches over a part or the whole surface of the body, resulting frequently in hard swellings of the connective tissue¹⁾, which may or may not be followed by a breaking down of the histological elements involved. Sooner or later the poison may attack the periosteal and perichondrial membranes, especially in those parts of the body where they are covered but thinly by the softer tissues. From the periosteal and perichondrial membranes the lesions extend to bone and cartilage.

*) Der Herr Verfasser ersuchte uns um den Abdruck dieser im Jahr 1868 erschienenen Arbeit, weil der in Wien erregte Streit über die Aetiologie der Syphilis gezeigt hat, dass Salisbury's Arbeit in Deutschland theils noch ganz unbekannt, theils in Vergessenheit gerathen ist. Salisbury ist der erste Entdecker der begleitenden oder causal wirkenden Organismen der meisten Infektionskrankheiten.

1) These swellings are caused by a too rapid development of the glue tissue cells, excited by the active growth among them of the *Crypta syphilitica*.

The primary sores represent the primary disease. The lesions of the connective tissue of the lymphatic glands and loose connective tissue of the body, which accompany or immediately follow the primary sore, indicate that the poison has permeated the system. These may be called the primary constitutional disturbances, to distinguish them from the primary local lesions at the point or points of inoculation.

After an interval of longer or shorter duration, following the primary manifestations, the sub-epidermic and sub-mucous connective tissues begin to show signs of invasion in the shape of blotches, mucous patches, tumours, condylomata, &c. These disturbances are called secondary. Following the secondary manifestations, at a more or less remote period, the periosteal and perichondrial membranes, and the bony and cartilaginous tissues become involved. The invasion of these last-named tissues marks the tertiary stage of the disease.

With these few prefatory remarks I will proceed to briefly narrate the results which I have arrived at by long-continued, patient, and careful labour. It is possible that I over-estimate what I have found, but whether I do or not, time and careful investigation only can determine.

My microscopic examinations, connected with syphilis, were commenced in 1849. It was not, however, till the winter of 1860 that I made any satisfactory progress, for plants of this character had been but little studied, on account of their habitat, their resemblance to connective-tissue filaments, and their extreme minuteness. From the commencement of my microscopic studies I have made it a rule to figure and describe every new body, and to note all the circumstances connected therewith likely to be of interest. By following this course patiently, although it has been a work of labour, yet it has made me familiar with the genesis and habits of a large class of minute organisms which are almost entirely unknown to science, and which, I conceive, have an important bearing upon disease.

The *Crypta syphilitica* is one of these minute organisms. No substantial progress was made in my investigations so long as I was examining the pus alone. This seems to have been an almost barren field. The only thing found that seemed to be foreign to pus from other sores, was a small, highly refractive sporoid body, which subsequent discoveries demonstrated to be the spore

of the *Crypta syphilitica*. In studying this minute form, I was led to dissect out the bed of chancres, and subject them to careful microscopic examination, when I soon discovered a peculiar filament, running in all directions, singly and in bundles, through and among the diseased connective-tissue elements. This organism was soon determined to be algid, It was found in multitudes, in all stages of development, from the spore to the mature filament (figs. 1 to 5). Up to the present time, I have carefully worked up over one hundred cases in this way, dissecting out the base of the primary sore, and have uniformly found this vegetation; and what is still more interesting, this same vegetation shows itself in the blood so soon as the disease becomes constitutional. Its presence or absence in the blood is believed to be a sure guide for continuing or discontinuing treatment.

The filaments, as they occur in the blood, are more highly refractive, and have the peculiar obtusely rounded extremities, in a more marked degree, than those found in the beds of the primary sores. Both are, however, equally homogeneous throughout. The filaments in the blood are frequently found united at one end in bundles, while they radiate at the other in more or less rigid uniform curves. This vegetation has a peculiar tendency to develop in connective tissue, cartilage, and bone. When once planted in the organism, it has a tendency to remain either in a partially dormant or in an active state, till removed by remedial means. It seemingly may remain in the system, under certain conditions, for years, or a lifetime, without producing any serious trouble; or it may, if circumstances are present that favour its development, produce grave and continued disease and suffering. Under favourable states of the system, the tendency seems to be for the vegetation to gradually lessen; and probably, in some few instances, it may eventually entirely disappear. This vegetation may be transmitted from one individual to another, during the secondary and tertiary stages, under the proper conditions, without producing the primary disease. I have noticed many instances in which the father having had the disease previous to marriage and where the poison was not entirely eliminated, even though no outward manifestations of the disease had shown itself in him after marriage, this vegetation was transmitted to, and found in the blood of the wife and children many years after. In many cases of this kind, this vegetation produces no

visible impression upon the systems to which it is transferred; while, upon others, it produces more or less marked constitutional disturbance.

Genus. *Crypta* (Salisbury). — Minute, transparent, highly refractive algoid filaments, which develop in living organic matter from spores.

Species. *C. Syphilitica* (Salisbury). — A homogeneous filament, with extremities obtusely rounded. The filaments are of such uniform structure throughout that no trace of transverse markings are visible save in their early stage of development; neither can the contents be distinguished from the outside wall of the filament. The filaments are either straight, coiled, or arranged in curves. They develop from spores, which may be active or inactive in the connective tissue, and may be transplanted from one individual to another by inoculation, or by contact with mucous membranes. They are believed to produce the disease known as syphilis. The connective tissues, in their various modifications, furnish a fertile soil for the development and propagation of this plant. When the spores are planted on a mucous surface, they vegetate, the filaments making their way through the basement membrane, instead of extending laterally in the epithelial tissue. The epithelial tissue, in the primary disease, is only destroyed immediately over where the plants first penetrate the glue tissue beneath.

The following is a brief report of a few cases selected from my notebook. The illustrations are drawn from the plants and spores found in the cases here given. I have a great number of other cases of like character recorded, but those given will suffice for the present: —

Case I — Mr. H. B., aet. 28, strong, robust man; called Nov. 9, 1865; labouring under primary syphilis. Never has had the disease before; has a large chancre on the penis, just back of the glans. Eighteen days since exposure, and six since the disease first made its appearance. Cauterized with the liquid pernitrate of mercury, and twelve hours after removed the dead tissue produced by cauterizing. On teasing this out carefully, and placing it under the microscope, discovered a large number of algoid filaments (*C. syphilitica*, fig. 5), many of them very long and variously coiled, and running in an irregular, zigzag manner in every direction among the connective tissue elements. These

filaments were highly refractive, transparent, and homogeneous throughout, having no perceptible transverse markings, or line of demarcation between the outer wall and contents. The filaments were of uniform diameter throughout, and had the peculiarity of having abrupt extremities. The spores (fig. 1), and embryonic filaments (figs. 2, 3, 4) were found in multitudes everywhere through the diseased tissue. The glands in the groin were slightly enlarged and tender. Examined the blood carefully; could find no trace of the filaments or spores of the *C. syphilitica*. Prescribed as follows: — *R.* — Dilute citrine ointment $\mathfrak{J}\text{ij}$; Venice turpentine $\mathfrak{J}\text{ij}$ —*M.* *S.*—Apply to chancre morning, noon, and night, after carefully washing. *R.*—Potass. iodid. $\mathfrak{V}\text{vj}$; tr. cinchona comp. $\mathfrak{V}\text{vj}$; sulphur $\mathfrak{J}\text{ij}$ —*M.* *S.*—Take a teaspoonful before each meal. *R.* —Acid. nitro-muriatic. dil. $\mathfrak{V}\text{vj}$; quinae sulphat. $\mathfrak{J}\text{ij}$ —*M.* *S.*—Put a teaspoonful in half a pint of warm water, and wash the body and limbs all over every night on retiring, and wipe dry after. *R.*—Pil. hydrarg. prot. iodid. $\frac{1}{4}$ gr. each, No. xxx. *S.*—Take a pill two hours after each meal. *R.*—Potass. acetat. $\mathfrak{J}\text{ss}$; potass. nitrat. $\mathfrak{J}\text{ss}$; aq. camphor. $\mathfrak{V}\text{vij}$ —*M.* *S.*—Take a tablespoonful in a glass of water at night on retiring.

On the eighth day after cauterizing, the chancre was entirely healed, and glandular enlargements in groin nearly gone. On examining the blood carefully again, I found the spores and short filaments of the *C. syphilitica* in it in considerable quantity. Continued the treatment for two weeks more; then dropped the mercurial, and gave in its place a two-grain quinia pill, and twenty drops of tr. ferri chlorid. in a full glass of water.

This treatment was continued, with slight variation, for a little over two months, at which time no trace of the *C. syphilitica* could be discovered in the blood. The iron and quinia are believed to have an important influence in preventing this vegetation from producing spores, and in checking the development of the filaments from spores, from the fact that by the free use of these agents with the ordinary treatment, this vegetation disappeared much more rapidly than when they were not used. They have this effect upon the vegetation of intermittent fever, and they also rapidly destroy the *Zymotosis translucens*, which is so abundantly present in anaemia, in tubercular conditions, and in inflammatory rheumatism.

Case II. — Mr. K. called April 7, 1867; age, 33; a strong, power-

fullybuilt man, weighing about 185 pounds. Had syphilis about three years previous; since then has had more or less secondary and tertiary trouble, in the shape of mucous patches and wandering pains, especially in shinbones and front part of cranium. Is low-spirited, languid, and has an uneasy feeling about the heart, with palpitation on excitement. Blood contains the *C. syphilitica* in considerable quantity. The specimen, Fig. 6, was found in the blood of this patient. It is unusual to find so long a filament in the blood, and one so evenly coiled. The blood also contains considerable cystine and stellite. Placed him on the following treatment: *R.*—*Pil. hydrarg. prot. iodid.* $\frac{1}{4}$ gr. each, No. xxx. *S.*—Take a pill two hours after each meal. *R.*—Sulphur $\mathfrak{5ij}$; potass. iodid. $\mathfrak{3vj}$; potass. bromid. $\mathfrak{5ij}$; wine colchicum (seeds) $\mathfrak{3j}$; tr. cinchona comp. $\mathfrak{3vj}$.—*M. S.*—Take a teaspoonful before each meal. *R.*—Quinia sulph. $\mathfrak{5ijss}$; acid. nitro-mur. dilut. $\mathfrak{3vj}$.—*M. S.*—Put a teaspoonful in half a pint of warm water, and wash the body and limbs all over every night on retiring, and wipe dry afterwards. Continued this treatment for four weeks. I then dropped the hydrarg. prot. iodid., and gave in its place a two-grain quinia pill and twenty drops of tr. ferri chlorid. in a glass of water, two hours after each meal. Under this treatment he improved rapidly. He is still taking the medicine. Lives on plain diet, avoiding all sweets, acids, and stimulants. Blood at the present writing (July 27, 1867) is almost entirely free from the spores and filaments of the *C. syphilitica*, the mucous patches and pains and aches are all gone, and he feels well.

Case III. — Mrs. K. called for treatment May 1, 1867; age, 36; pale, anaemic, and feeble; has not had her courses for four months; has been sick for the last four years. Does not know that she has had syphilis, and hence did not question her so as to excite suspicions. Found that in the early part of her sickness she had severe ulceration of womb and vulva, with swellings in groin, and considerable leucorrhoea, for which she was treated locally. About three months after this, blotches appeared over the whole body; these were followed by hard swellings, many of which resulted in sores. Her mouth and throat were ulcerated and very sore. These manifestations of secondary trouble gradually passed away under treatment. At the time of her visit to me the surface of the body was smooth, but had a few mucous patches on roof of mouth and in fauces. Had a severe cough, with pains in chest,

heart, back, and limbs. For the last two years has raised some blood from lungs at different times. Before raising blood, would get hoarse, have a chill, followed by fever, which was accompanied by the raising of blood. Blood thin and watery, and contained many spores and rigid filaments of the *C. syphilitica*. The plants and spores represented in Fig. 7 were figured from specimens found in the blood of this patient; they were present in all stages of development. Placed her under the following treatment: *R.*—Dilute citrine ointment $\mathfrak{Jjss}$; Venice turpentine $\mathfrak{Jss}$.—*M. S.*—Apply to sores morning, noon, and night. *R.*—Quinia sulph. $\mathfrak{Jij}$; acid. nitro-mur. dilut. $\mathfrak{Jvj}$.—*M. S.*—Put a teaspoonful in half a pint of warm water, and wash the body and limbs all over every night on retiring, and then wipe dry. *R.*—Potass. ioidid. $\mathfrak{Jvj}$; tr. cinchona comp. $\mathfrak{Jvj}$; sulphur $\mathfrak{Jij}$.—*M. S.*—Take a teaspoonful before each meal. *R.*—Pil. hydrarg. prot. ioidid. $\frac{1}{4}$ gr. each, No. xxx. *S.*—Take a pill two hours after each meal. *R.*—Potass. acetat. $\mathfrak{Jjss}$; potass. nitrat. $\mathfrak{Jss}$; ammon. hydrochlor. $\mathfrak{Jij}$; aq. camphor. $\mathfrak{Jvij}$.—*M. S.*—Take a teaspoonful in a glass of water night and morning. She improved rapidly till she left town, about six weeks after she first called. Ordered her to continue the medicine. The last I heard from her she was progressing finely.

Case IV. — Mr. E., miller, called May 7, 1867. Has secondary and tertiary syphilis. The septum of nose is entirely eaten away, and the parts ulcerating and offensive. Is very hoarse; scarcely able to speak so as to be understood. Tonsils and fauces covered with ulcerating patches. Has severe neuralgic pains in forehead, and suffers much with deep-seated aches in shin-bones. Blood full of the filaments and spores of the *C. syphilitica*. The mass of filaments and spores, represented at Fig. 8, is from the blood of this patient. Placed him on the following treatment: *R.*—Pil. hydrarg. prot. ioidid. $\frac{1}{4}$ gr. each, No. xxx. *S.*—Take a pill two hours after each meal. *R.*—Potass. ioidid. $\mathfrak{Jvj}$; tr. cinchona comp. $\mathfrak{Jvj}$; sulphur $\mathfrak{Jij}$.—*M. S.*—Take a teaspoonful before each meal. *R.*—Quinia sulph. $\mathfrak{Jij}$; acid. nitro-mur. dil. $\mathfrak{Jvj}$.—*M. S.*—Put a teaspoonful in half a pint of warm water, and wash the body and limbs all over every night on retiring, and then wipe dry. *R.*—Tr. iodinii $\mathfrak{Jjss}$. *S.*—Paint over temples, back of ears and neck, and over shins every day. *R.*—Dil. citrine ointment $\mathfrak{Jj}$; Venice turpentine $\mathfrak{Jijss}$.—*M. S.*—Apply to nasal cavity with a soft brush every morning, noon, and night.

Ordered the patient to inhale from an atomizing apparatus every morning the following: *R.*—*Tr. iodinii* ʒj; *potass. chlorat.* ʒij; *potass. nitrat.* ʒij; *tr. conium* ʒij; *tr. cimicifugae rac.* ʒj; *aq. camphor.* ʒxv.—*M. S.*—Inhale an ounce every evening. Continued this treatment till the neuralgic pains ceased, and then omitted the mercurial, and gave two grains of quinia and twenty drops of *tr. ferri chloridi* in a full glass of water two hours after each meal. Under this treatment the patient has slowly but steadily improved. The nose, throat, and fauces are well, no blotches on the surface, and the blood is almost entirely free from the *C. syphilitica* (July 27, 1867). In addition to the foregoing treatment, I gave to this patient, to keep up free elimination and to allay febrile symptoms, the following: *R.*—*Potass. acetat.* ʒjss; *potass. nitrat.* ʒss; *ammon. hydrochlor.* ʒij; *aq. camphor.* ʒvij.—*M. S.*—Take a tablespoonful in a glass of water at night on retiring.

II. *Gonorrhoea.* — The epithelial tissue seems to be the only one properly adapted for the development and propagation of the specific poison of gonorrhoea. That portion of this tissue peculiarly susceptible to the disease is the mucous membranes. The parent cells of these surfaces, and especially those of the urinary and genital organs and eye, afford all the necessary conditions for the growth and multiplication of the cause. If once planted here, it extends from cell to cell, if not prevented by remedial means, till it has invaded all the mucous surfaces in continuity with each other. That the gonorrhoeal virus multiplies rapidly under the proper conditions, like the lower cryptogams, has long been noticed.

As long ago as 1850, I first discovered in gonorrhoeal pus minute sporelike bodies, multiplying by duplicative segmentation in and out of the cells. Although I figured these bodies accurately at that time, I was not sufficiently familiar with these minute cryptogams to determine either their place or significance.

After having discovered the *Crypta syphilitica* in the beds of chancres, I was led to examine carefully the tissue invaded by gonorrhoea. Selecting such cases of the disease as had not been subjected to treatment, and where the discharge was copious and the inflammation severe, the patients were directed first to void their urine; the lips of the meatus were then separated, and with the clean edge of a small scalpel I scraped the epithelium from the orifice of the urethra, and placed the scrapings between

the slides of the microscope. The specimens thus obtained were each examined carefully, often for many hours together, watching the changes produced by gradual drying, and making accurate notes of all the abnormal bodies and appearances present. I had not pursued this mode of inquiry long, before I discovered the spores (fig. 9) which I had previously found in the pus scattered about among and in the parent epithelial cells, and here and there found filaments, single and in little knots, in all stages of development. These filaments were soon discovered to emanate from the minute spores previously mentioned. In the embryonic filaments (fig. 13) a moniliform structure could be observed, exhibiting the outlines of the individual spores, while the more advanced and mature filaments were usually homogeneous throughout their entire length (figs. 14 and 15).

From 1862 to the present time I have worked up carefully several hundred cases in this way, and have made careful drawings, with full notes. In all of these cases this peculiar vegetation has been found: in some cases the spores only; in others, the spores and embryonic filaments; and in still others, the spores and filaments in all stages of development were found. Believing this plant to be the specific cause of gonorrhoea — not being able to find it in mucous membranes affected with other inflammatory derangements — I have given it the name *Crypta gonorrhoea*.

The spores (figs. 9 and 10) are very minute and well defined. They are often discovered in twos and sometimes in fours (fig. 9), undergoing the process of duplicative segmentation. They occur and develop rapidly, in gonorrhoea, in and among the parent cells of the mucous surfaces affected, producing great irritation and inflammation, and a rapid formation of muco-pus cells, which often form around the spores, and thus become vehicles for eliminating the virus from the parent cells. In this way nearly every particle of gonorrhoeal discharge becomes loaded with the specific cause. The spores are represented at figs. 9, 10, 11, and 12. At fig. 12 they are developing in the nucleus of a parent epithelial cell. In and among the epithelial cells this plant is frequently met with in its filamentous stage of development. The filaments are found in all stages of growth, from a length double the diameter of a spore to several inches, when magnified four or five hundred diameters (fig. 14). In their embryonic stages, frequently a monili-

form arrangement may be noticed (fig. 13). In later and more advanced stages of development they are usually homogeneous throughout their entire length, no transverse markings being visible (figs. 14 and 15). The outlines of the filaments are generally well defined. They occur either singly or in little knots, running a more or less tortuous course. The filaments are represented at figs. 13, 14, 15 and 16. At fig. 16 the filaments are covered with spores. This is an unusual occurrence.

In some instances the pus-cells become filled with the spores of this vegetation; the spores destroying the nucleus and cell-granules of the mucus or pus-corpusele, it becoming simply what appears to be a spore-case or sporangium. These apparent spore-sacs vary from the size of a pus-cell to three, four, and even five times the size. They are represented at fig. 11.

It is an interesting fact that this plant is limited in its invasion to the epithelial tissue, while the *Crypta syphilitica* confines itself mainly to the connective, cartilaginous, and osseous tissues. This explains why, perhaps, the latter produces constitutional derangements, while the former does not.

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Autor(en)/Author(s): Salisbury J. H.

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