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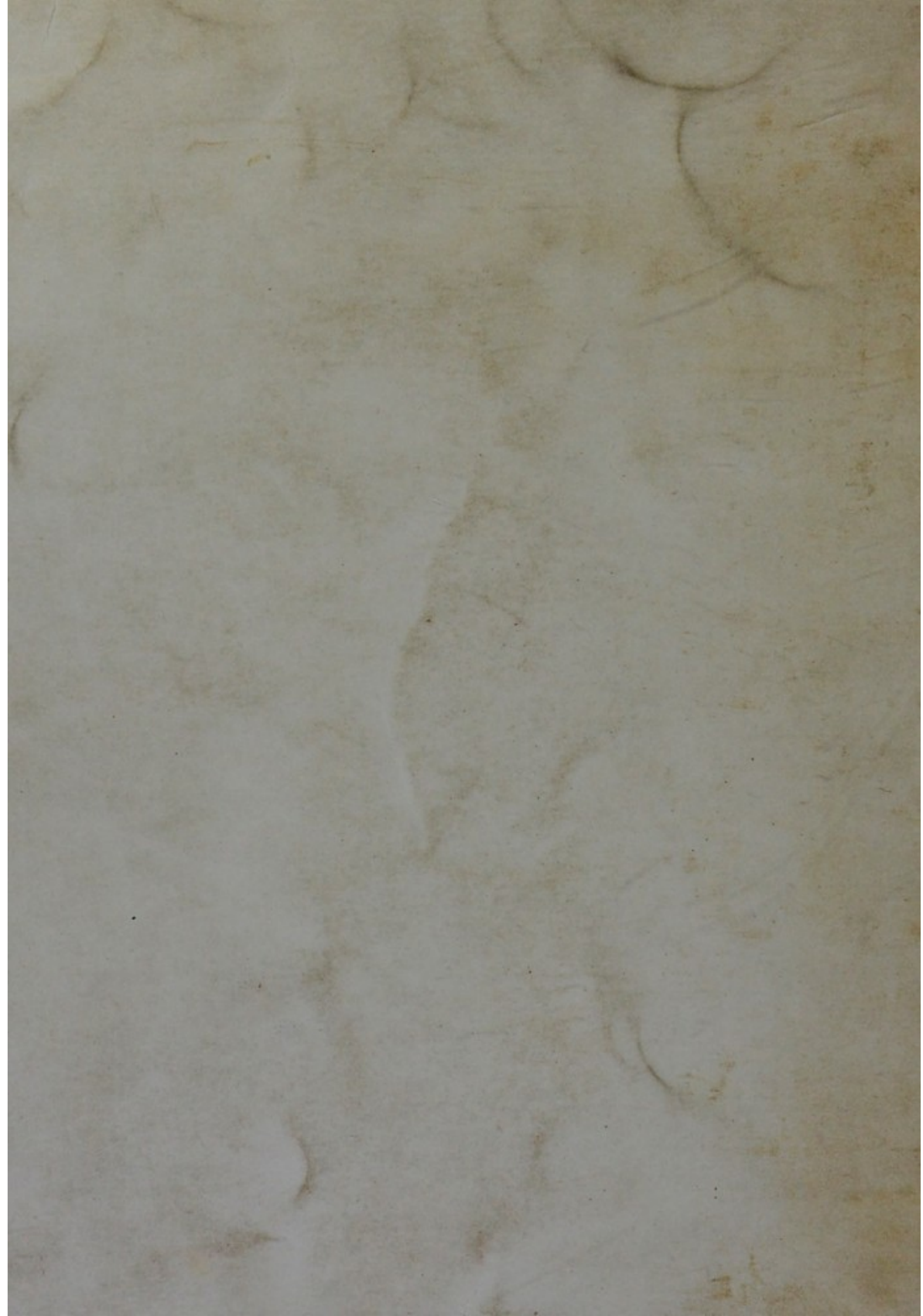
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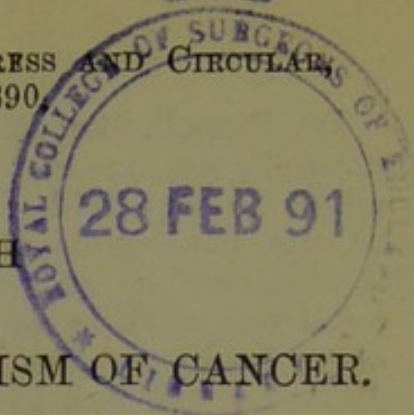
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(17)

A SEARCH
FOR A
CHARACTERISTIC ORGANISM OF CANCER.

By JABEZ HOGG,

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Hospital.

IN the *Medical Press and Circular* for Dec. 17th there appeared a paper of more than passing interest on "A Characteristic Organism of Cancer," by Dr. Wm. Russell, and in the same number a leading article which bestowed deserved praise on Dr. Russell for his discovery of the organism, and whether it becomes an established fact or not, cannot fail to excite great interest and attention in the profession. It is, as the writer justly observes, "put forward with much caution, which many bacteriologists would indeed do well to imitate; he carefully abstains from building up a theory upon his facts, the significance of which he leaves to be made out by subsequent and more extensive investigations." For myself, I may say Dr. Russell's researches so far possess more than ordinary interest, as very many years ago I was a diligent worker in the same direction, and tending towards the same object, the discovery of a special micro-organism of cancer. In the course of my investigations I almost invariably met with spores of various fungi, but this I subsequently attributed to the fact, one I was among the earliest to discover, namely, that the spores of *Thallophytes* and *Cellulares* are always floating about in the air of town and country, and consequently that these would often be found in diseased structure exposed to the air for ever so short a time, and that all decaying substances are naturally the seat of fungoid growth. Dr. Russell's more recent investigations aided by certain reagents, a double staining process, not in vogue at the period I was at work, enables him to say: "I have absolutely no doubt that the organism present in most of the cancerous structures examined is a fungus which belongs to the sprouting fungi (*Sprosspilze* of *Nägeli*), a class of fungi which includes the yeast fungus."

Dr. Russell, like other scientific cautious observers, is naturally anxious to obtain confirmatory evidence, and which he hopes will give strength to his views, and add to the pathogenic significance of his discovery, and it will doubtless interest him to know that forty-six years ago I was working at the subject. In the first edition of my book on "The Microscope," p. 394, published in 1854, he will find the following emphatic statement: "That terrible disease cancer will no doubt ultimately prove of vegetable growth; a conversion of the nutritive animal cell into that of the fungoid vegetable cell." For very many years my researches on cancerous diseases were continued, and during the same period included the parasitic diseases of the cutaneous surface generally. My results and the conclusions arrived at were published from time to time in the medical journals. In January, 1859, I read a paper before the Medical Society of London "On Parasitic Diseases." This paper appeared in the *British Medical Journal* of March 26th of the same year, and was subsequently translated for *L'Union Médicale*, and published January 12th, 1860. In my researches on the parasites infesting the human skin, I met with only eight cases of lupus, in three of which, of a pronounced scrofulous or tuberculous nature, I discovered a number of fungus spores, and some of the material when introduced into saccharine solutions induced an active state of fermentation.

Further papers in continuation of my investigations appeared in the *Journal of the Royal Microscopical Society*, 1865, with illustrations. Some of my drawings represent pretty closely Dr. Russell's "fuchsine bodies." These papers and drawings were subsequently collected and re-published in pamphlet form the next year. On page 14 the following remarks appear: "What part do fungi or bacteria play in the production of that fearful scourge of the human race, cancer? is a question not unfrequently put to me since in the first edition of my book on the microscope I stated my belief in its fungoid origin. Subsequent examinations of diseased structure tend to confirm the view then expressed. It appears to me that in this disease we have superadded to the fungoid growth 'degraded germinal matter,' and which having attained entrance into the circulation produces a ferment and blood-poisoning. The animal cell becomes degenerated, and is finally converted into

the ovoid vegetable cell. . . . This cell bears the most perfect resemblance to certain spores of fungi, and to the yeast plant. As might be expected the form is modified, and the character of the cell more or less changed by the tissue in which it grows; its powers of growth are so to speak perverted and degraded, and then, as is observed in other instances, it will obtain a power of indefinite multiplication, and thus destroy the vitality of one organ after the other." Here appeared my more matured views on the fungoid nature of cancer in 1865. Since when they have been repeated in much the same terms, and in the several large editions of my book on the microscope (the eleventh published in 1886). My views were considerably strengthened some half a dozen years ago after the date given above, when in 1869 I had the good fortune to receive specimens of a very remarkable form of disease; the Madura or fungus foot disease of India, the microscopical examination of which especially excited the astonishment of dermatologists, and of the members of the Pathological Society of London. In these specimens I met with enormous masses of fungus in all stages of growth, and which not only destroyed the softer tissues, but also the hard bony structures of the foot. It was, however, a long time before I could bring myself to believe that the delicate mycellium threads or spores of a fungus could cause the destruction of the several tissues of the human foot, the further ravages of which could only be arrested by timely amputation. My researches and investigations of this destructive form of disease were published in the "Path. Soc. Trans., 1869," with illustrations, and later on, 1871-72, additional observations appeared in the *Medical Times and Gazette*, and in the "Royal Microscopical Soc. Trans." with lithographed plates of the appearances presented. Many of the sporules bear a strong resemblance to the fungus spores, "fuchsine bodies" of Dr. Russell. The fungus spores met with in fungus foot disease, as well as in cancerous structures, more closely resembled those of artificially produced yeast known as German yeast, than that of the natural product. But I will not at present pursue this question further, since it is well known that there is a wide spread polymorphism among fungi, one in particular is known to possess six different kinds of fructification; *uredo* exhibits four, all of which were at one time classed as distinct species.

At this point, or not long afterwards, my labours were suspended; first, by the deaths of two old professional friends, who were not only interested in my investigations, but to whom I looked for the greater part of the gross material for my microscopical researches; secondly, by the discussion, then rather fiercely waged as to the part played by the floating germs pervading the atmosphere, and which tended towards the foundation of a *germ theory of disease*, (a) and it was hardly to be expected that cancer would form an exception.

Notwithstanding the better and ready differentiation of tissue by the method of double staining, and the significant results thereby obtained by Dr. Russell, I must confess that I look with some interest for the confirmation of the conclusion he has arrived at, that the fungus germs discovered by him are "characteristic of cancer."

Fungi, I would remind him, live and thrive only in a material susceptible of, or already undergoing, decomposition. It can hardly be, then, that fungi themselves originate or produce disease, although the products which they generate will greatly add to the symptoms and results manifested by a special form of disease. In 1873 I contributed to the *Lancet* a paper on the pathology and microscopical appearances presented by the diphtheritic membrane, and in close connection with which I discovered the mycellium threads of a fungus, together with bacilli, and which seemed to bring conviction to my mind that these micro-organisms were the cause of diphtheria. My researches in parasitic diseases of the skin appeared now to imply that the sporules of fungi seen in connection with them must be taken to be something more than mere accidental organisms among the proliferating epithelium, but reflecting on the universality of the distribution of these lowly-organised vegetable bodies, and their known disposition to set up chemical decomposition in the pabulum on which they feed places one at a considerable disadvantage in any attempt to define the exact part the fungi play in any specialised form of disease.

(a) See my book on "Parasitic Diseases." London: Baillière Tindall, and Cox. 1873.