

in childhood compels me to say that it is as certainly microbic in nature as measles or whooping-cough, in neither of which the microbe has yet been demonstrated.

But it is no longer a matter of inference merely that rheumatic fever is a microbic disease, for it has been proved by Dr. Poynton and Dr. Paine of St. Mary's Hospital¹ that a diplococcus can be isolated from the tissues of a patient who has died from rheumatic fever, and also from blood obtained by venesection during life, which can be cultivated in pure culture in a special medium, and which, when injected intravenously into rabbits, can produce in them a transitory arthritis of several joints, pericarditis, valvulitis, cardiac degeneration and dilatation, pleurisy and pneumonia, and yet nowhere any suppuration. By careful staining of their sections they have succeeded in demonstrating these organisms in the substance of the mitral valve, in the tonsils, and in many other organs. They have found them also in that most typically rheumatic lesion, the subcutaneous nodule. Their results will, of course, require confirmation by other observers, but it certainly looks as if the problem of acute rheumatism has at last been solved.

IMPORTANCE OF THE DIAGNOSIS OF CARDIAC DILATATION.

Finally, let me appeal for greater care and accuracy in the examination of the heart by percussion and palpation. It is a matter of great importance to the patient. Dilatation and feebleness of the left ventricle may indicate, as I have shown, urgent danger of death from syncope, and neglect of this indication may cost the patient's life. Dilatation of the right auricle (quite easily detected by percussion in the fourth right interspace), and weakness of the right ventricle (detected by palpation of the epigastric region) are usually accompanied by considerable dyspnoea and often by some lividity. A marked degree of dilatation of the right auricle (from two to three fingerbreadths to the right of the sternal margin in the fourth space) may indicate grave danger of death from asphyxia and call urgently for venesection or leeches.

After a considerable experience as an Examiner in Medicine I am forced to the conclusion that these facts are still very inadequately recognised, for I rarely meet with a candidate who understands the object of percussion of the heart or the proper method of procedure. He usually thinks only of the useless "superficial cardiac dulness," and contents himself with trying to determine a horizontal upper limit (which does not exist), and then palpating the cardiac impulse, as if that were equivalent to the left border of the dulness! The right limit of the heart he usually neglects altogether. And even some physicians of great eminence are apparently not conversant with the fact that the dulness of the right auricle normally extends one fingerbreadth into the fourth right space, and that its border can be quite easily detected by careful light percussion.

Let me assure you, gentlemen, that there is really very little difficulty in the determination of the actual size of the heart, and that a small amount of careful practice will demonstrate to you what an enormous advantage both to your patients and to yourselves will result if you will accustom yourselves to consider this as an essential part of the investigation of every case to which you are called.

REFERENCES.

¹ Goulstonian Lectures, 1892. ² Croonian Lectures, 1900. ³ *Lancet*, May 12th, 1900. ⁴ *Ibid.*, September 22nd and 29th, 1900.

UNIVERSITIES FOR WOMEN IN JAPAN.—The rich family of Mitsui of Tokyo has offered an extensive site in that city for the erection of a university for women, and three other citizens have between them contributed a sum of £24,000 for the cost of the necessary buildings. The work is already in progress, and it is hoped that the new university will be opened in the spring of 1901. It is not likely that there will be any want of students, as in recent years very many young ladies of good family have applied to be admitted to the university courses, especially to the Faculty of Medicine and the Polytechnic School. The latter institution is intended for the training of civil engineers, a circumstance which seems to show that Japan is about to set an example to Europe in opening up a new sphere of labour for the women of the future.

EPIDEMIC ARSENICAL POISONING AMONGST BEER DRINKERS.

BY

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INTRODUCTION BY NATHAN RAW, M.D.

THERE is every appearance that the severe epidemic of arsenical poisoning which was first accurately diagnosed by Dr. Reynolds, is subsiding. It is difficult to accurately determine when the outbreak actually occurred, but the following table, showing the admissions of cases of alcoholic neuritis, is of great interest as giving some idea when the contamination of the beer really began. The symptoms of alcoholic neuritis and arsenical neuritis are, as far as I can determine, very much the same when the lesion is advanced; but the association of pigmentation of the skin renders the diagnosis clear.

Table of Admissions of Cases of Alcoholic Neuritis in 1898 and 1900.

	1898.	1900.
January	3	0
February	1	5
March	1	1
April	0	2
May	3	7
June	2	11
July	4	12
August	1	17
September	3	25
October	2	22
November	3	26
December	3	15 up to Dec. 10th.
Total	26	143

From this table it would appear that the contamination of the beer commenced about June, and remained fairly constant until November, when a further increased contamination took place causing more acute symptoms.

Arsenical melanosis, using the term in its etymological sense to indicate a deepening or blackening of the skin, was accurately described by Nielsen, who records some previous outbreaks of arsenical poisoning. Moreira reports some cases where the skin was diffusely pigmented after taking rat poison, and Barthélemy reports 405 cases of arsenical poisoning at Hyères, which resulted from the mistake of a wine merchant who poured a solution of arsenic into his wine casks. Of these cases the greatest number showed general pigmentation of skin varying from brown to black. The same writer thinks that the great outbreak which occurred on the banks of the Seine in 1828, and again in 1829, causing the loss of 40,000 lives, was due to arsenical poisoning of wine. I have had over 70 cases of neuritis during the present epidemic under treatment with so far only one death. The majority of the cases are slowly improving, some have been discharged recovered, whilst a small minority have advanced motor lesions, with but small hope of permanent recovery. I have only been able to detect arsenic in the urine in 5 cases out of 33 examined, and these were all recent acute arsenical attacks. The symptoms have been so well described before that it is unnecessary to recapitulate them, but they have been undoubtedly caused by the presence of arsenic in the sulphuric acid in the manufacture of invert sugar or glucose used largely in brewing cheap beer and stout. This sugar has been promptly withdrawn, with the result that the cases have very rapidly decreased. The quantity of arsenious acid has in some cases been found to be as much as 3 grs. per pound of sugar, so that it is possible for a glass of beer to contain one-fifth of a grain of arsenic, and certainly some severe lesions have been pro-

duced in those who only took one or two glasses a day for some time.

The epidemic seems to have been almost entirely confined to the very poor people, who drank what is called "fourpenny" and "sixpenny" beer; hence it is that the best opportunities have occurred in the workhouse infirmaries for observing the symptoms. I am indebted to my colleagues, Drs. Graham, Williams, and Clark for great assistance in the preparation of this paper, and also to Dr. Grünbaum.

THE SKIN LESIONS.

By FRANK H. BARENDT, M.D.Lond., F.R.C.S.Eng.,
FOR the opportunity of making the following observations I am indebted to Dr. Raw, to whom my warmest thanks are due.

The skin affections naturally fall into two classes, those resulting from a sudden debauch and those due to the daily and not immoderate use of the poisoned beer.

Class I.

A typical case in which the patient, previously teetotal for several months, consumed between 30 and 40 pints in three days, presented the following condition some two days after the bout of drinking.

The face was swollen, dusky red, eyes suffused, the pinnae and skin very itchy and covered with fine furfuraceous desquamation. The margins of both pinnae showed well-marked scratch lesions, and the patient complained of general pruritus. The integument of the limbs was tingling and the seat of fornication; here and there distinct effects of scratching were noticeable. The hands and feet were painful, and in some cases a red condition of the digital extremities—erythromelalgia—was present.

Class II.

This class includes the great majority of the patients, and the condition of the integument is, it may be said, typical of the outbreak, and also pathognomonic of this form of arsenical poisoning.

The face is dusky red, and the complexion modified by shades of burnt umber, depending upon the amount of, and the period of cessation from, the implicated beer.

The integument is strikingly pigmented. This is best appreciated when the patient is viewed from a distance. The pigment is like burnt umber, most intense in those regions naturally pigmented, passing into lighter shades of colour elsewhere. In some cases the skin presented a stippled condition, as if the burnt umber had been painted on like a close mesh enclosing islets of white skin, split pea in size. It is also well marked where the covered and uncovered skin meet, and over the sites of garment pressure, the flexures and internal aspect of the limbs.

Thus the neck, especially the site of the neck-band, was deeply pigmented. The axillæ, the inner aspect of arms, and cubital flexures showed the discoloration to a marked degree. Frequently the episternal region and the upper half of the intermammary furrow and region were less pigmented, owing doubtless to the fact that the women habitually wore their dress open. The areolæ and circumjacent integument were much darker than normal; in fact, in some cases the skin here resembled that of a mulatto. The flanks showed slighter discoloration, which, however, gave place to intense bronzing as the abdominal and inguinal regions were approached.

The abdomen, and in women the site of the waist pressure, were deeply bronzed. The lineæ albicantes were plainly visible through the discoloration. The inner aspect of the thighs (femina), especially the upper two-thirds, was much altered in colour, the lower third less so; the hams were much pigmented. Apparently the legs in the men were more bronzed than those of the women; the exposure to daylight accounts for this difference. The posterior aspect of the trunk was less pigmented than the anterior. The discoloration was appreciated least in the interscapular and infra-scapular regions, and became intensified towards the axillæ, gluteal, and inguinal regions. Generally speaking the flanks, extensor aspect of the body was much less pigmented than the flexor.

The pigmentation of the skin comes out in vivid contrast when placed in juxtaposition with a patient of the same natural complexion; and fair patients suffered less than swarthy ones.

In the course of a few days desquamation becomes increas-

ingly manifest, and then the condition of the skin resembles that seen after chrysarobin dermatitis, the red colour of the latter being replaced by the burnt umber colour of the former.

Itching was not a prominent symptom in this class of case. Intelligent patients remarked on their discoloration some time before they sought advice for the neural symptoms.

The interpretation of the pigmentation is important, and there is no doubt that many cases have been diagnosed wrongly, as (1) morbus Addisonii or (2) morbus reorum, attributed to phtheiriiasis, absence of cleanliness, stress, and strain of existence.

(1) *Morbus Addisonii*.—With respect to the first, no pigmentation of the various mucosæ was observed, and the rosa of the lips showed no discoloration. Moreover, the eyelids were not areolated in pigment, and although the pigmentation was diffused all over the body, certain regions were intensely discoloured. Again, the pigmentation was rarely unaccompanied in some regions by desquamation, and the subjacent epidermis was distinctly lighter and devoid of pigment in comparison. Lastly, the absence of other features of Addison's disease would be noted.

(2) *Morbus reorum* (vagabonds' disease) is typified by considerable pigmentation. The distribution of the pigmentation, accompanied as it is with scratch lesions due to phtheiriiasis, is different. It is most marked in the nuçæ, the interscapular and infrascapular regions, the upper half of the chest, and extensor aspect of the limbs, in marked contrast to that which obtains in all these cases. The general condition of the skin, the *misère* of the patient, and the precarious existence will readily clinch the diagnosis.

Of other disturbances, hyperidrosis, zona, and eczema arsenicale occurred. The latter attacked the palms and soles, and in a typical case they looked as if a dusting powder had been rubbed into the furrows and creases of the skin. The furfuraceous desquamation gradually disappeared, remaining longest in the palmar and plantar grooves.

In conclusion, the most characteristic skin disturbance is the pigmentation, and, as far as my experience goes, it is unlike any other form that has been recorded. Arsenical pigmentation is not infrequent after administration in psoriasis, but the sites of this disease determine those of the pigmentation which has never assumed the distribution and type met with in these cases caused by arsenical contamination of beer, except after prolonged administration of the drug.

THE CONDITION OF THE NERVOUS SYSTEM.

By W. B. WARRINGTON, M.D., M.R.C.P.

OF the cases at present under observation, it may be said that those which show the most marked symptoms indicative of arsenical poisoning present the least evidence of well-defined neuritis. Several cases have been noticed in which pigmentation was excessive and conjunctivitis marked, but in which even the slight sensory symptoms suggestive of a neuritis could not be found.

It is, however, to this class of case that we must look for any distinguishing signs between an arsenical neuritis and that due to alcohol. There have been under observation other cases presenting the manifestations of arsenic poisoning, and having, also, evidence of profound neuritis with marked palsies, but in none of these cases could excess of alcohol be excluded.

Considering, then, the symptoms in those from whose history it may fairly be assumed that they have been only moderate takers of beer and stout, we find sensory disorders brought obtrusively into notice. These are:

1. *Numbness and tingling* comes on rapidly in both hands and feet. In some cases all the patient complained of was pain of a scalding or burning character in the soles of the foot, which caused a dread of attempting to walk.

2. *Pain*, often most acute on pressing the sole of the feet, especially at the heel, ball of great and little toe. In nearly all cases the pain on moving the joints was excessive, and equally so on pressing the muscles, this latter symptom was also noted in a number of cases in the forearm muscles.

3. *Erythromelalgia*.—Several cases presented a red, flushed appearance of the sole, especially at the great toe and heel,

rarely spreading on to the dorsum of the foot and associated with pain, but the swelling which, when associated with pain and redness, is described as typical of the condition has only been seen in 1 case.

4. *Sensation*.—In no cases could distinct objective impairment of sensation be found.

5. *Knee-jerks*.—In these early cases the knee-jerk was often present and perhaps unusually brisk.

6. *Ataxia*.—This has not been noted in our cases, in the absence of palsies the difficulty in maintaining the equilibrium has usually been attributed by us to the painful condition of the feet. There has always been the ability to describe passive movements of joints.

In the more advanced cases these types of sensory symptoms predominate, hyperæsthesiæ being most pronounced. The motor symptoms did not present any appearances that we are not accustomed to see in the neuritis of alcohol, and in none of the cases in which mental alteration was present could this latter poison be excluded. In no cases were the cranial nerves, the intercostals, or phrenics affected.

CLINICAL AND PATHOLOGICAL NOTES ON A CASE OF HUMAN ACTINOMYCOSIS.*

WITH CONCLUSIONS DRAWN FROM IT AS TO THE NATURE OF THE DISEASE.

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ON March 8th, 1898, a big, well-built man, aged 23, was admitted to Sir Patrick Dun's Hospital, Dublin, under the care of Dr. Bennett, Professor of Surgery at Dublin University. He complained of a large inflammatory swelling round his neck, which made him carry his head bent on his chest. The patient could in no way account for his illness, as though attending cattle there had not been a sick beast amongst them.

History.—This swelling had started four months previously as a small hard lump below the lobule of the left ear between the angle of the jaw and the mastoid process. It grew to the size of an orange in three weeks, caused him great pain, and prevented him opening his mouth, so that he got a doctor to incise it. This gave slight relief, but only blood escaped from the incision.

Condition on Admission.—The swelling went on increasing and extending, so that on admission to hospital he had a large, brownish-red, brawny swelling, extending from the lobule of the left ear round the back of the neck to the right ear, passing round the right side and front of the neck and down on the sternum. Fluctuation could be detected over a large part of the back of the neck, and at several places there were deep sinuses discharging fetid brownish pus, while at other parts there were small fungoid masses projecting from the surface. The only parts tender to the touch were those which the swelling had most recently extended to.

Diagnosis.—From the history and appearance of the case, Dr. Bennett made the diagnosis of actinomycosis, and being house-surgeon in the hospital at that time I was able to collect all the pus from the large abscess at the back of the neck, which was opened shortly after his admission.

Examination of Pus.—The pus, which was very fetid and blood-stained, was spread out in a thin layer on a large piece of plate glass laid on a black surface, and everything at all resembling actinomycetes granules was picked out and examined fresh and stained. No typical granules were found, but only a few small masses like inspissated pus about the size of a pin's head. Examining these fresh, they were seen to consist of small fat globules and pus cells, and in only one of them could I find what resembled a single club. Preparations stained by Gram's method showed long convoluted chains of what looked like streptococci, and very like what is depicted in von Jaksch's *Clinical Diagnosis* (English Edition, 1839, p. 353). The pus and scrapings from the walls of the abscesses were frequently examined later on, but nothing further was ever found during life.

Cultivation Experiments.—Aerobic cultures were made several times, but nothing resembling actinomycetes or any streptothrix form was found. Anaerobic cultures were not made.

Later History.—Some weeks after the opening of this abscess another formed over the sternum and opened of itself, and a little later another was opened at the vertebral border of the scapula, scraped out and plugged with beta-naphthol. At about this period the patient developed signs of tuberculosis of the lungs, especially the right, but no tubercle bacilli could be found in the sputum, and it was considered that the lung affection was due to extension of the abscess at the right scapula into the lung. This was proved later on by the patient expectorating the tincture of benzoin emulsion, which was being used at the time for wash-out out the abscess cavities owing to their number and the risk of constantly applying strong antiseptics to so large an absorbing surface. During the next three or four months abscesses kept on forming about the back and neck, which were opened and scraped out, and then either plugged or swabbed out with almost every conceivable antiseptic; but most of them proved quite intractable and kept on discharging, while a

few healed up. A notable feature about all these abscesses was that they never communicated in any way with each other, arising, as it were, spontaneously at comparatively distant parts.

Death.—During the last three months of his illness the patient emaciated to an extreme degree from the profuse suppuration, and died on November 24th, 1898, with advanced amyloid disease and all its usual symptoms after an illness of almost a year's duration. Throughout the illness the temperature kept more or less above normal, usually dropping when an abscess was opened but finally becoming hectic.

POST-MORTEM EXAMINATION.

External Appearances.—The body, which was examined forty-eight hours after death, was greatly emaciated, all the bones visible, no subcutaneous fat, skin straw coloured. On the back of the neck the skin was hard and thickened, dark brown coloured, and covered all over with sinuses, some of which were discharging a thick brown-coloured pus. This condition extended over the entire back of the neck from the occiput to the first dorsal vertebra. There was an old sinus 1 inch above and internal to the lower angle of the right scapula, which was closed. (This had internal relations described below.) Several old healed sinuses were also present over the dorsal vertebrae and right scapula, and one behind the angle of the lower jaw on the right side.

Abdomen.—The abdomen was full of clean straw-coloured fluid, all the viscera pale, liver and spleen much enlarged.

Lungs.—Both thoracic cavities were full of straw-coloured fluid. The apex of the right lung was adherent, especially posteriorly, but the adhesions were easily broken down except at the angle of the third rib, where the lung tissues had been torn in trying to separate it from the rib. On doing this a distinct roughness was felt in the lung, due to a piece of necrosed rib superficially buried in the lung tissue. There was a ragged hole at the angle of the third rib about the size of a pea, from which brownish pus exuded on squeezing the intercostal spaces above and below it. On enlarging this hole the rib could be felt necrosed and the finger poked down beneath the skin of the back in the direction of the closed sinus at the angle of the right scapula, but even with a probe this scar could not be completely reached. No communication in any other direction could be established. This was the sinus where fluid was syringed into the lung from the skin during life. The apex of the left lung was much more adherent than the right, and parietal and visceral pleurae had to be stripped together. No ulceration into the lung was visible, but on looking at the chest wall the lateral surface of the second dorsal vertebra and adjacent head of the second left rib were seen to be quite rough and necrosed, but no communication any deeper into the vertebrae or soft parts could be made out, nor was there any pus here. The right lung was firm and hard at the apex; the base purple and oedematous, anterior margin pale and emphysematous. On section the apex was solidified and red coloured, studded over, especially under the pleura, with small white spots, not raised or hard, and not very like tubercles. There was also one other patch that exactly resembled a true corpus luteum, with a reddish jelly-like central mass, surrounded by a tortuous whitish margin. The left lung presented somewhat similar appearances. The rest of the lung tissue in both lungs was merely congested and oedematous.

The other viscera presented nothing of special interest. All the abdominal organs were amyloid, and the heart looked exactly like brown atrophy, but showed no change microscopically to confirm this view.

On examining a section of the skin stained with logwood and counterstained with acid fuchsin and picric acid (van Gieson), the epidermis and dermis are seen to be unaffected, except where the abscesses broke through the skin. There is, however, great congestion of the vessels of the true skin.

The lesions are mainly situated in the subcutaneous tissue, which is greatly thickened and very dense, and consists largely of granulation tissue in various stages of development. In the least affected parts there are masses of dense connective tissue, with patches of round-cell infiltration, and more recent tissue composed of young connective tissue cells, small round cells, and polymorpho-nuclear leucocytes. There are some places where the tissue is composed of large round cells, with almost clear protoplasm and a large nucleus not very rich in chromatin, usually with a nucleolus; some of them are vacuolated, and appear to include red corpuscles, which are freely present between them; they give no special reaction to polychromatic methylene blue, and are most likely the hyaline connective tissue cells described by Unna in Orth's *Pathology*.

Passing on to the more affected parts, the tissue consists of very vascular granulation tissue which in places, in the neighbourhood of the actinomycetes, has been extensively infiltrated with polymorpho-nuclear leucocytes, and in some parts broken down into actual pus. In these latter places the actinomycetes has usually fallen out of the section, but it can be frequently seen surrounded by a wide zone of polymorpho-nuclear leucocytes and remains of granulation tissue.

The actinomycetes, with van Gieson's stain, examined with a low power, usually appears as an irregularly round or oval maroon-coloured dense mass, about 0.15 mm. in diameter on

*Read before the Pathological Section of the Royal Academy of Medicine in Ireland.