ment of chromophilic material in the perikaryon and apex, and the numerous dendrites with fine threads. From a woman aged 59. Chronic melancholia.

2.—Granular degeneration of the chromophilic material, from the same case as above. In the apex the threads are seen to be broken up into linearly arranged segments. The perikaryon measures 99 × 49 μ. The nucleus (17 × 12 μ) is deeply stained, and with clusters of granules around its margin. The nucleolus measures 6 μ.

3.—Large (? swollen) cell (210 × 83 μ) stained of a pale, dull, uniform blue, and showing no trace of chromophilic material, either in perikaryon or processes; the nucleus is dimly visible, and centrally situated; the nucleolus measures 10 μ. The apex breaks up into a pale, fan-shaped expansion. From a case of puerperal mania aged 25.

4.—Dark, irregularly-stained cell (90 × 63 μ), showing the pale, ill-defined, ragged apex, and peripherally situated nucleolus (8 × 5 μ) surrounded by a paler zone. The processes are few, show no chromatin, and curl upon themselves when detached from their matrix. From a case of secondary dementia in a man aged 56.

5.—Cell with normal arrangement of chromatin, showing a leucocyte destroying the apex.

Colitis. By Alfred W. Campbell, M.D., Pathologist, Rainhill Asylum, Lancashire.*

By colitis one understands a disease characterised anatomically by an ulcerative or membranous affection of the large intestine, and signalised clinically by acute sanguinolent or muco-purulent diarrhœa, *plus* pyrexia and prostration.

Certain lengths of the intestine are specially prone to disease, viz. the cæcum and first part of the ascending colon, the dip of the transverse colon, the lower part of the descending colon, the sigmoid flexure, and the rectum.

On anatomical grounds it is justifiable to divide the cases into two groups:—(*a*) Membranous colitis. (*b*) Ulcerative colitis.

The first variety is characterised by the formation on the surface of the mucosa of a thick membrane, dark in colour, rough and harsh to the touch, and composed of disintegrating epithelial elements, fibrin and red blood-corpuscles, inspissated mucus and leucocytes, solids deposited from the fæces, and swarms of bacteria. This membrane may form in patches, or it may spread itself over the entire surface of the bowel. It does not tend to separate.

Similarly, in the ulcerative variety the whole surface of the large intestine from cæcum to anus may show disease, or it may be limited to the localities above specified. The ulcers

* Abstract of a paper read at a meeting of the Medico-Psychological Association in London on May 12th, 1898.

vary in size and shape, their edges are angry-looking, undermining is a pronounced feature, and the floor is usually formed by the muscular coat. In some instances they perforate.

Not only in membranous, but also in ulcerative colitis it is not uncommon to find a membranous affection of the lower few feet of the small intestine.

In both conditions the glands, into which the lymphatics from the large intestine empty, undergo inflammatory enlargement and occasionally suppuration.

In females suffering from either variety, a complication in the form of a sloughing cystitis and vaginitis is common. This arises from the passage of fæces containing the noxious virus into the vulva.

According to the reports of the Commissioners in Lunacy, the diseases colitis, diarrhœa, dysentery, and enteritis accounted for 1·56 per cent. of the total deaths occurring in English asylums, &c., in the year 1895, and 2·35 per cent. in the year 1896.

Out of a total of 9628 deaths occurring in the four Lancashire County Asylums during the years 1883 to 1896 inclusive, 247, or 2·56 per cent., were attributed to the four above-mentioned diseases.

It definitely appears that colitis affects persons of advanced or moderately advanced years much more frequently than younger members of the population.

With the single exception of chronic interstitial nephritis there is no disease of abdominal or thoracic organs which can be coupled with colitis, or in any sense regarded as an ætiological factor in its production. Out of twenty eight cases of ulcerative colitis collected by the writer, chronic interstitial nephritis was found in eleven, and out of eighteen cases of membranous colitis the same disease existed in eight. The association between these two diseases has been already indicated by Hale White in an analysis of a series of cases of colitis occurring at Guy's Hospital.

There is likewise no special mental or nervous disorder with which colitis can be associated.

General debility, be it the result of physical illness or chronic mental complaint, brings susceptibility to colitis. This point was determined in 78 per cent. of the writer's cases.

Colitis may appear at any season of the year, but is more prevalent during the late autumn and early part of the winter than at other periods.

Though the disease does occasionally break out in epi-

demic form, single isolated cases are often met with. That the infective virus gains its entry *per os* is likely, but not definitely proved. Concerning its infectiousness, this term can only be applied in a limited sense, for it is rarely communicated to sane individuals exposed to most of the same conditions as those that suffer. I refer to nurses and attendants on the insane, but that the disease is, at any rate, to some extent infectious is indicated by the fact that during the past two or three years the deaths from colitis in Rainhill Asylum have been far less numerous than they formerly were, and this diminution has been synchronous with the adoption of measures for the isolation of such cases, for the disinfection or destruction of their excreta, and for the therapeutic treatment of the condition by free lavage of the large bowel with copious injections of bactericidal enemata.

Abnormal constipation or coprostasis, as well as other mechanical causes, are factors of no practical import in the production of colitis.

In the same way grounds for all toxic causes, *e. g.* decayed fruit, spoilt food, or impure water, are all hypothetical.

A microscopic examination of the freshly voided fæces for the *Amœba coli* has always been attended with a negative result, and it is certain that that organism is not related to colitis.

In a long series of cases plate cultivations of the fæces have invariably yielded abundant colonies, sometimes pure cultures, of a micro-organism bearing all the characters, morphological, biological, and chemical, of the *Bacillus coli-commune,* but differing from normal samples of that organism in the possession of a higher degree of virulence, and I am forced to conclude that the bacillus stands in close pathogenic relation to colitis.

In regard to its virulence, a series of experiments conducted in Professor Rubert Boyce's Laboratory (Liverpool) show that doses of from 1 to 3 c.c. of a broth culture, forty-eight hours old, suffice to cause diarrhœa and early death in rabbits and guinea-pigs when injected subcutaneously or intra-peritoneally. In some instances a like result attended the administration of cultures of the organism *per os.*

Points in favour of the suggested specific pathogenicity of this bacillus are—

(1) In other forms of dysentery, tropical, epidemic, and sporadic, a similar organism of extreme virulence has been isolated (Celli and Fiocca, Maggiora, Arnaud, and others).

Celli named the organism which he isolated the *B. coli dissenterico.*

(2) There is abundant proof that, under certain conditions, the *B. coli* may assume a condition of great virulence.

(3) Colitis is a disease which we should expect, above all others, to result from an increased virulence of the *B. coli,* because the large intestine is its normal habitat.

A microscopic examination of various tissues, *e. g.* small and large intestine, lymphatic glands, kidneys, &c., reveals the presence of two principal forms of bacteria, a short rod-shaped bacillus similar to that above mentioned, which predominates, and micrococci. It has been determined that these micrococci are of the pyogenic variety, and that they play a *rôle* in the production of ulceration is more than probable.

In a few cases only was the blood examined bacteriologically. In three instances cultures of streptococci were obtained, but the *B. coli* was never found. The results in this direction cannot be considered conclusive.

Discussion.

The PRESIDENT.—I am sure we are all indebted to Dr. Campbell for his most interesting paper. The disease he has discussed is one which we see more or less in asylums, and one that sometimes gives us extreme trouble. I was very much interested in his remarks as to the causation and symptoms of the disease. I should especially have liked to hear more about those apparently inexplicable and solitary cases of fatal colitis that one meets with now and again in institutions otherwise absolutely free.

Dr. GOODALL.—I did not quite catch, in Dr. Campbell's very interesting paper, reference to the insanitary state of asylums, of which no doubt he is well aware, and with which this disease is so commonly associated, namely, the condition of ventilation, sewers, faulty and defective drainage, trapping, &c. The disease is one which I believe is especially found in the older asylums. In one with which I was associated it was very common, and with the improvement in the sanitary condition, particularly the drains, the death-rate gradually diminished. Enteric disease and colitis seemed to occur in the autumn of the year, and they would disappear with attention to the sanitary state. I do not thereby wish to throw any doubt on the organism, and I am very glad it has been worked out, and I hope it may prove to be correct. The difficulty is to see how the organism can be conveyed with sewage emanations, sewer gas, &c., because I believe the pathogenic organisms have not been demonstrated. It may be possible to find out whether this organism is present in sewer or other gas, and it would be interesting if it could be grown by means of experiment, and a culture might hereafter be injected. We should then have an antitoxin which would be very useful.

Dr. JONES.—I am in charge of what is absolutely a new asylum, and I am therefore not quite a believer in the "insanitary" origin of colitis. I have here a few notes taken hurriedly of about eighty-five post-mortems in cases of colitis—that is to say, out of a death-rate of 1450 no less than 85, nearly 6 per cent., have been due to colitis. I classified these according to ages, as follows:

Between	20	and	30	.	.	.	.	3 males.		
„	30	„	40	.	.	.	.	10 females,		10 males.
„	40	„	50	.	.	.	.	11	„	8 „
„	50	„	60	.	.	.	.	4	„	5 „
„	60	„	70	.	.	.	.	13	„	5 „
„	70	„	80	.	.	.	.	7	„	5 „
„	80	„	90	.	.	.	.	2	„	2 „

It will thus be seen that my statistics correspond pretty closely with those of Dr. Campbell. Then as to the time of year. Dr. Campbell has mentioned the autumn. I think in the autumn and the spring there is a very distinct increase in the death-rate. For instance, in my cases there were in—

January	. .	1 of each sex.			July	. . .	2 females, 1 male.
February	. .	8 females,	2	males.	August	. .	6 „ 7 males.
March	. . .	7 „	2	„	September	.	7 „ 7 „
April	. . .	5 „	4	„	October	. .	4 „ 7 „
May	. . .	2 „	0	„	November	. .	2 „ 4 „
June	. . .	1 „	1	male.	December	. .	2 „ 2 „

Dr. Campbell referred to the amœba, and also to the *Bacterium coli-commune* as being present in the normal colon, but the difficulty is how one or other of these gets into the blood. My observations post mortem do not quite coincide with Dr. Campbell's as to the infrequent appearance of the stercoral ulcer. I have often seen it, and if once you get an abraded surface there is every opportunity for these organisms to infect. I am glad to hear so much distinction between the membranous and ulcerative varieties of colitis. I had hitherto looked upon the membranous as the extreme and acute sloughing form of the same disease, modified perhaps less by a difference in the toxin than by the resisting power of the host. Acting upon the idea that this disease was distinctly contagious or infectious, we are, I am happy to state, almost entirely free from it now at Claybury. Everything in the shape of clothing or soiled linen that comes away from the patient is disinfected, first in 1 in 20 of carbolic acid, afterwards it is taken for further disinfection into a "Washington-Lyons." I was very much struck by the fact that the nurses who gave the rectal injections occasionally took colitis from the patients.

Dr. RAYNER.—The subject which Dr. Campbell has dealt with is such a wide one that one cannot enter into it at all fully. In my own experience I recollect that colitis was very much diminished in wards in which cases had frequently occurred by the substitution of block-wood and polished floors for the old washed stone floors. I cannot help thinking that a predisposition is given by imperfect mastication, the food continually passing through the bowels imperfectly digested, and acting as an irritant.

Dr. CAMPBELL.—I am very much obliged for the interest which my paper has aroused. In regard to Dr. Goodall's remark concerning the association between colitis and any insanitary condition in an asylum, I regret that I did not bring the matter forward in my paper. I intended to, but it has been very much cut down. I do not think, as far as my own investigations go, that there is any association between insanitary conditions and colitis, although I believe that such might play a part in their production. At one time I suspected a certain ward. It was closed, and a careful examination made, but nothing was discovered to support my suspicion. We then concluded that it must be the condition of the patients. The ward was one in which chronic epileptics and depraved patients were kept; and this really was one of the things that set me thinking about the physical conditions which assist in bringing about colitis. Dr. Jones' remarks are very interesting, and I am much obliged to him for bringing his figures here. His age statistics agree very well with my own. I am not absolutely certain about the season of the year, namely, that it is more common in the autumn. There is no doubt it does occur in all seasons, and

quite recently I have had two cases, the only two for a year. I cannot find proof of the disease having been directly passed from one patient to another, and on questioning my colleagues I could only find instances of two cases in which the disease had been communicated to attendants in the asylum.

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*The Industrial Training of Imbeciles.** By G. E. SHUTTLEWORTH, B.A., M.D., Medical Examiner of Defective Children, London School Board; formerly Medical Superintendent, Royal Albert Asylum, Lancaster.

IT occurred to me that, on the occasion of our division meeting at an asylum which has made special provision for the care and treatment of imbeciles, apart from the other patients, a brief dissertation as to forms of industrial training appropriate to such might not be out of place.

In the training of imbeciles, I think that all experience teaches that educational processes should be moulded with a view to ultimate industrial usefulness. In school, indeed, the senses must be sharpened, the muscles disciplined, and the intellectual powers exercised; but after all no great degree of scholastic proficiency can be expected. I do not mean that where sufficient capacity exists, the inculcation of the "three R's" should not be attempted, for doubtless the imbecile's enjoyment of life will be increased by an ability to read books, to correspond with friends, and to add up figures. When the patient belongs to a higher social grade, a larger share of time may be devoted to such studies, though even with such it must be remembered that more is learnt by the hand than by the head, and manual training is often the best means of mental amelioration, producing as it does tangible results which are a source of satisfaction both to teacher and taught. But with patients belonging to the pauper class, it seems hardly justifiable to consume a large proportion of the plastic period of youth in what we ordinarily term "school work." Rather should it be utilised for the acquirement of technical skill in some industry which will enable the imbecile to produce something towards the cost of his maintenance. It is true that in many cases appropriate physical exercises will be needed as a preliminary measure to correct motor irregularities which would militate against precision in handicraft. *Athetosis* may be adduced as an instance of this, and it is wonderful how much may be done in helping

* Read at the Spring Meeting of the South-Eastern Division at the Middlesex County Asylum.