chloride in water by the mouth. The calcium chloride was retained, and was continued in 10-grain doses each hour for the first twelve hours, and then reduced to every four hours. Her condition next day (twelve hours after the first dose of calcium chloride) showed considerable improvement. The frequency of pulse and respirations was about the same, 126 and 40, but she had lost the cyanosis and was breathing easier and deeper, and the tension of the pulse had improved; vomiting had ceased, and the temperature was 101° . The greatest improvement was in the sputum. Its quantity was reduced by about one-half. It was thicker, and its bright haemorrhagic appearance had become a dull rusty tint.

After this the disease ran a normal course; the temperature never went above 101° , and the case terminated by a not very well-marked crisis beginning in the evening of the seventh day.

CASE II.—The Dry Type.

A tall, slight, unmarried woman, aged 25, a *masseuse* by occupation, had double basic pneumonia commencing in the left lung and followed a few days afterwards by involvement of the right lung. Through the whole attack the disease ran a dry course. The physical signs were those of consolidation, the percussion note being markedly board-like in character until resolution took place by way of the lymphatics. There was practically no cough, and there was no sputum. The general condition of the woman was good throughout the attack; her temperature never went above 101° ; she had no difficulty in respiration, its highest recorded rate was 28; the highest pulse-rate was 84. It was not until the fourth day, when the right lobe became involved, that, owing to the second cardiac sound becoming accentuated, ammonia, strychnine, and brandy were administered.

In this case, fearing thrombosis, the aim of my treatment was to decrease, or at least prevent any further increase in, the coagulability of the blood. For diet she was given soups, meat extracts, jellies, bread and butter, tea; she was allowed fruit, and was encouraged to drink fresh lemon juice in water to quench thirst. Milk in any form was denied. Medicinally, except for the ammonia, strychnine, and brandy after the fourth day, she had nothing but potassium citrate.

There was a crisis on the eighth day, the temperature dropping to 99.2° , where it remained for a couple more days, owing, no doubt, to a mild attack of follicular tonsillitis which followed the pneumonia.

In Case I I consider the benefit of the calcium chloride was due to its action upon the blood. By increasing its coagulability, the serous haemorrhage was lessened, and more space thereby given for respiration and the elimination of CO_2 . The reduced temperature and the improved blood tension were due, in my opinion, to the same cause. Beyond these effects the calcium salt had no influence upon the course of the pneumonia itself, which ran on to its natural termination.

In Case II the woman did not get any thrombosis, but whether she would have done so if treated with a milk diet and calcium salts, of course it is impossible to say. Anyhow I saw no reason for the administration of calcium, and one reason against it.

There were two other points of interest in the above cases. Case I had had several attacks of urticaria, and Case II had been in the habit for the three or four years preceding her illness of drinking a pint of milk every day. This latter fact does not conform to the opinion that the long-continued administration of calcium delays the coagulability of the blood. My regret is that I made no exact experiments as to the coagulability of the blood in the two cases at the time.

Judging from the light of further experience, I think that until the time arrives when we shall be able to administer a suitable antitropine, our treatment of

pneumonia must remain symptomatic; its object being, if one may so express it, to keep the patients alive until Nature has cured the disease. In the symptomatic treatment of pneumonia, calcium is a valuable drug in the haemorrhagic type of cases; but in the dry type of cases personally I should fear to use it, and, as it is in this type we more often fear death from toxæmia, it is, in my opinion, more rational to prescribe citrate of sodium or potassium, owing to their power of increasing the alkalinity as well as the fluidity of the blood. In the type of cases where heart failure is feared, unless there is a special call for calcium, I consider that there are other drugs of more value.

NEW METHOD OF ISOLATING THE BACILLUS TYPHOSUS FROM INFECTED WATER.

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A FULL account of the methods used to isolate the *Bacillus typhosus* from infected water is given in a paper by H. S. Willson in the *Journal of Hygiene*, October, 1905.

Therefore I do not propose to compare them systematically with the method about to be described; suffice it to say that most of them have been tried in this laboratory, and have not given satisfactory results. This criticism applies especially to the various precipitation methods, Hoffmann and Ficker's enrichment method being far superior to any of them.

Apparatus for Evaporation.

The principle of the method here in question is to evaporate water under reduced pressure. The accompanying sketch shows how the evaporation is accomplished.

A is a water bath maintained at 37° to 40° C. This temperature can be easily obtained by regulating the height of the flame of the Bunsen burner. No special gas regulator is required, though Reichert's may be used with advantage. In the bath are two Winchester quart bottles containing the water to be examined. Rubber corks fit into the necks of these bottles and should be so shaped that they will not be driven in when the pressure in the interior of the bottle is reduced. These corks are perforated by glass tubes which project into the interior of the bottles. The surface of the water should be at least 4 in. from the end of these tubes, so as to prevent the water bubbling into them when it begins to boil. These tubes are bent at an angle immediately above the top of the corks. The advantage of an acute bend is that the condensed water finds a suitable gradient towards the worm of the condenser B, with which the tubes are connected by means of a T-shaped glass junction and rubber pressure tubing. Through the glass vessel surrounding the worm there is a continual flow of cold water, entering by the pipe *a* and leaving by the pipe *b*. The worm is connected with a large bottle C, which is also connected with a water filter pump D, which is secured to a pipe *p* coming from the main by means of stout tubing braced with cloth, cord and wire. By this means a partial vacuum is obtained in the bottles and the water readily boils at 37° C. The vapour readily condenses and the distillate is collected in C. It requires twenty-one to twenty-two hours to evaporate a litre of water.

After starting the process it needs no further attention till the end is almost reached, when one should be at hand to stop it at the proper moment.

One filter pump can only deal efficiently with one or two bottles, if more are connected up with it the distillation process is proportionately slowed.

It has been found that when the *Bacillus typhosus* is introduced into the bottles it is not destroyed by this treatment, but that multiplication occurs, and that this multiplication can be stimulated still further by the addition of 10 c.cm. of broth to the litre of water.

The residual water is put on Conradi-Drigalski plates (not adding more than 4 c.cm. to each plate), and smeared over them with a T-shaped glass rod. The more Conradi-Drigalski plates used and the more of the residual water examined, the better is the chance of finding the typhoid bacillus. However, such an amount of multiplication occurs that if the typhoid bacillus was present it will be found in 1 to 2 c.cm. of the residue.

The more or less anaërobic conditions prevailing and the high temperature favour the development of the typhoid bacillus, and are inhibitory to many water organisms.

After the water has been spread over the plates they are dried at 37° C. in the incubator, the covers put on, and the plates are inverted. It is best to stop the evaporation when 20 c.cm. of water remain in the bottle. If the evaporation is carried further the precipitated flocculent matter and the high concentration of salts may interfere with the growth of the colonies on the Conradi-Drigalski plates. I may add, however, that after evaporating to dryness, and then adding a few c.cm. of water to the bottle, and shaking and then transferring to Conradi-Drigalski plates, colonies of typhoid bacilli have developed.

Method of Ascertaining the Number of Bacilli added to the Water.

To judge of the efficiency of the method it is necessary to know the number of bacilli added to the bottles. For this purpose I have been in the habit of adding, by means of a fine capillary pipette, two drops of a 24-hours broth culture of the *Bacillus typhosus* to 100 c.cm. of sterile water in a flask; then, after shaking, taking 1 c.cm. of this and adding it to a second 100 c.cm.; then 1 c.cm. of this is added to a third 100 c.cm. After shaking, 1 c.cm. is taken from the last dilution and distributed over four Conradi-Drigalski plates, and at the same time 1 c.cm. is added to 1 litre of water. The number of colonies that develop on the plates gives approximately the number of bacilli added to the water.

Experiment.

To 1 litre of sterile tap water were added 10 c.cm. broth and seventeen typhoid bacilli. The evaporation was completed in twenty-two hours, 28 c.cm. being left in the bottle; 1 c.cm. of this residue was distributed over four Conradi-Drigalski plates. Forty-eight colonies developed on these plates. Therefore $28 \times 48 = 1344$ = number of bacilli in bottle at end of process. And as there were seventeen bacilli present at the commencement there had been thus an 80-fold increase. The bacilli were proved to be typhoid bacilli by cultural and agglutination tests.

In this experiment sterile water was used, so that other organisms giving blue colonies on the Conradi-Drigalski plates might not be counted as typhoid. In other experiments ordinary tap water was used with equally satisfactory results. I have recovered the typhoid bacilli where as few as two have been added to a litre of water. The salts present in ordinary water do not, even in concentrated solution, destroy the typhoid bacillus.

Belfast tap water is a moderately hard water. A chemical examination gave the following result:

Free ammonia	...	...	0.001 part per 100,000
Albuminoid ammonia	...	...	0.020
Total solids	...	...	15 parts per 100,000
Total hardness	...	...	7
Chlorine	...	...	1 to 3

From some preliminary experiments it seems that the presence of *B. coli communis* does not interfere with the usefulness of the method; but it can especially be recommended where an attempt is made to isolate the typhoid bacillus from a suspected water which, according to ordinary standards, might be deemed free from pollution.

Finally, my best thanks are due to Professor Symmers for the interest he has taken in the method, and to Dr. Rankin for sketching the apparatus.

UNDER the will of the late Mr. William Guiver Wright, of Paddington, which has now been proved, St. Mary's Hospital, Paddington, receives a sum of £200.

THE SCIENCE COMMITTEE

OF THE

British Medical Association.

REPORT CI.

THE STRUCTURE AND SECRETION OF THE PARATHYROID GLANDS IN MAN.*

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THE histology of the parathyroid glands has already received attention from previous observers. In his original paper, Sandström¹ described it with detail and accuracy as far as he went. After pointing out how varied were the appearances presented by sections of the glands, he proceeded to recognise three main types. In the first the cells were arranged in a continuous mass; in the second the structure was more open, consisting of a reticulum of cells, the meshes of which were occupied by blood vessels; while the last type showed an arrangement of cells to form small vesicles, in some of which were drops of a substance possessing the staining properties of colloid.

While confirming the Swedish anatomist's work, Welsh² carried the subject further. He described four types: (1) The cells form a uniform mass, their protoplasm taking little if any stain, and there being but slight degree of vascularity. (2) The cell masses show a tendency to break up into anastomosing columns, between which are capillaries borne in a fine connective tissue stroma; the protoplasm stains somewhat more deeply than before. (3) The cells form branching columns between which lies a fine or dense stroma bearing blood vessels. These cells are larger and faintly staining. (4) The cells are arranged in a single layer around a central lumen to form definite acini. These cells are large, with protoplasm staining variously, and the lumen is usually occupied by a small globular mass of colloidal substance. Welsh specially notes that commonly several types coexist in one gland.

More important than this recognition of types is his description of what he terms "oxyphile cells." These he mentions as occurring in a very large proportion of cases, though not in all, and never attaining the same abundance as the above-mentioned cells ("principal cells"). They have a relatively large amount of protoplasm, which is usually full of fine oxyphile granules, and he thought he recognized differences between the nuclei of the two varieties of cells, those of the oxyphile being smaller, more nearly circular, and with their chromatin more densely plaited. According to their grouping he makes four types of these cells also. They occur as: (1) Uniform masses forming islets scattered irregularly through the gland; (2) anastomosing columns; (3) cells either singly or in groups of twos and threes; (4) cells forming definite acini, the lumina of which are occupied by colloid material—a very exceptional type. He does not offer any explanation of these cells, nor does he discuss their relation to the so-called principal cells.

In a preliminary communication to the Physiological Society in 1906, the cardinal points of the present paper were recorded. It will be found that while the following account corroborates the work of both Sandström and Welsh, certain hitherto undescribed points in the histology of the gland are brought forward, more especially as regards the interpretation of the two varieties of cells, and the nature of the secretion, and therefore of the function, of the parathyroids.

I.—STRUCTURE OF THE PARATHYROIDS.

The parathyroid is enclosed in a thin connective tissue capsule, from the deep surface of which delicate trabeculae

* From a paper read before the Pathological Society of London, February 19th, 1907.