despite the continued excretion of sugar in the urine. After a fast of 48 hr., these differences between normal and diabetic animals disappear.

The swimming experiments suggest a possible explanation for this observation. When the animals were killed immediately after swimming, only traces of liver glycogen were found in alloxan-diabetic animals. On the other hand, when the animals were allowed, after swimming, to recover for a few hours, glycogen was found in the liver of alloxan-diabetic animals in abundance, whereas in the controls no rise in the liver glycogen was observed. The obvious explanation of these findings is that the increase in liver glycogen after fasting in alloxan-diabetic rats is due to a stimulation of glycogen-neogenesis, probably in association with the decrease in the utilization of carbohydrates. The experiments show that alloxan-diabetic rats are able to store the newly formed glycogen in their liver. This behaviour recalls the so-called protein effect described by us in an earlier paper[2]. The situation is essentially different in coma, in the sense that although neogenesis of sugar occurs (high blood sugar during fast) storage of glycogen in the liver is no longer possible.

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Histological Demonstration of Mucin after Periodic Acid

THIS note describes the histological demonstration of mucin by Schiff's reagent following the action of periodic acid. Zenker-formol sections were passed to water, after iodine and hypo, and placed for two minutes in a 0·5 per cent solution of periodic acid in distilled water. The sections were then washed in tap and distilled water and placed in Schiff's reagent for fifteen minutes at room temperature. The customary rinsings in sulphurous acid, as for the Feulgen's test, followed, and the sections were dehydrated in alcohols and mounted in balsam after xylene.

The mucus of the goblet cells of the human intestine and bronchus coloured strongly, as did mucous salivary glands, certain pituitary cells, the colloid of the pituitary stalk and thyroid, granules in some nerve cells in the medulla of the rat and in the human intestine, and the basement membranes of the tubular epithelium and of the glomerulus in the kidney.

The technique is presented as a histological method which appeared during the course of an investigation of the histochemical use of periodic acid. Periodic acid was found by Malaprade[1] to form aldehyde when it split a chain between two carbon atoms each bearing a hydroxyl group, and Nicolet and Shinn[2] found the split occurred also between two carbon atoms if one bore a hydroxyl group and the other an amino group. The new method bears some resemblance to Molisch's test-tube reaction of carbohydrate and mucoproteins, in which an aldehyde is produced by the action of sulphuric acid and gives a colour with α-naphthol. Dempsey and Wislocki[3] say that Schiff's reagent can be used for demonstrating aldehyde derived from mucoprotein after 'mild hydrolysis'.

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Analgesic Properties of Derivatives of Diphenylethylamine

WE were very interested by the reports of Dodds, Lawson and Williams[1] on the analgesic properties of some derivatives of diphenylethylamine. We noticed that, according to those authors, the β-hydroxy compound seems the most promising, although its analgesic power is principally noticeable in the severe pains due to nervous compressions due to cancerous tumours and metastases.

Since 1943 we have been trying clinically the same β-hydroxy compound (the drug was kindly supplied to us by "les Laboratoires Jean Roy"). We also found great analgesic activity on this type of pain. But we obtained successful results with this substance in other hyperalgic conditions, namely, cervical neuritis and trigeminal neuralgia.

Moreover, several cases of painful visceral contractions like enteric occlusion or spastic dysmenorrhœa were completely relieved of symptoms by giving 0·40–0·80 gm. of the drug. Therefore we suggest this compound should be investigated for its possible antispasmodic properties.

We occasionally observed side-effects: nausea or vomiting, with daily doses larger than 1·20 gm. But the absence of 'drug-habit' must be emphasized.

It seems to us that β-hydroxy-α,β, diphenylethylamine (or other derivatives of diphenylethylamine) is worthy of a more extensive clinical assay in the usual therapeutic field of morphine.

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Experimental Infection of the Larvæ of *Anopheles gambiae* (Dipt., Culicidæ) with a *Coelomomyces* Fungus

THE object of this communication is to record the experimental infection of laboratory-hatched larvæ of the malaria-carrying *Anopheles gambiæ* Giles with a fungus of the genus *Cœlomomyces* Keilin after transporting soil and fungal resting sporangia from the infected locality at Livingstone in Northern Rhodesia to Johannesburg (Transvaal), a distance of several hundred miles. The infection of the larvæ was obtained in a concrete trough after the resting sporangia had lain dormant for more than eight months. This note is supplementary to a paper by me published recently[1], and the species of the fungus is that referred to as type *a* in the paper.

It had previously been found that the resting sporangia of another species of *Cœlomomyces*—my type *c*, parasitic in the larvæ of *Aëdes* (*Mucidus*) *scatophagoides* Theo.—would germinate after a longish period of desiccation before being wetted again, the zoospore liberation of which has been described by De Meillon and Muspratt[2]. Couch[3] has placed the genus *Cœlomomyces*, which belongs to the Phycomycetes, in a separate family of the order Blastocladiales, and he notes: "In most species of the Blastocladiales, perhaps all, the resting bodies are incapable of germinating before undergoing a period of drying, and retain their vitality for a long time, up to several years in the dry condition".

Walker[4] was able to infect some laboratory-bred larvæ of *A. gambiæ* (*A. costalis* Giles) with *C. africanus* in a cement tank, and it is probable that if regular drying up of the tank and refilling had been resorted to, further infections would have been possible.

The following are brief notes on my own experiment. (1) A large number (300–400) of infected *A. gambiæ* larvæ packed full of thick-walled sporangia were collected and put into jars containing water and soil from the breeding-place. When the larvæ were dead, the water was allowed to evaporate and the soil to become nearly, but not quite, dry, when the lids were placed on the jars. About 100 lb. of nearly dry 'mopane' clay soil, with which the fungus appears to be associated at Livingstone, Northern Rhodesia, was sent to Johannesburg together with the jars of soil containing the dead larvæ. All the material was left in the laboratory over the winter.

(2) More than eight months later, during the summer, the main bulk of soil was dumped in the centre of a concrete trough 4 ft. 3 in. in length, 1 ft. 5½ in. in breadth, by 5½ in. in depth. This was placed outside the laboratory so as to be exposed to the sun for 3–4 hours each day; and the soil, in the jars, containing the resting sporangia in the larval remains, was scattered on the lower part of the mound of soil in the trough. A roof was put over the trough at night to prevent a downpour washing any of the soil out of it.

(3) The trough was filled with rain-water, which was poured over the mound of soil; and *gambiæ* larvæ, hatched from eggs, were put into it. The water was allowed to evaporate to dryness every two or three weeks, and the trough to remain dry for three or four days before it was refilled and another batch of newly hatched larvæ put in. After the water had been evaporated once and the trough refilled, about fifteen out of a hundred larvæ of the second batch became heavily infected, and a few in later batches; but the experiment had to be discontinued because of the difficulty of obtaining a regular supply of *gambiæ* eggs, and because it was found that the climate of Johannesburg is too cool for the larvæ to grow normally owing to the high altitude of nearly 6,000 ft. above sea-level.

I believe that in experiments with this species of the fungus, it may be necessary to use rain-water and allow it to evaporate in the sun to about one third of its volume before infection can be expected, the germination of the resting sporangia perhaps being regulated by a slight increase in the concentration of the soil mineral salts in solution. This corresponds to the conditions of infection found in Nature.

Although the above experiment did not prove that indefinite infection of *A. gambiæ* larvæ by the fungus can be obtained in a confined space, I feel confident that, given suitable climatic conditions, this would be the case. It will greatly facilitate a study of the life-cycle of this genus of fungi, with the view of finding out if it can be used for the biological control of this and other dangerous species of mosquitoes.

I am greatly indebted to Dr. Botha De Meillon, under whose supervision the experiment has been carried out in the Department of Entomology of this Institute, and I wish to thank Dr. Mastbaum and staff of the Swaziland Medical Service for sending me eggs of *A. gambiæ* from Swaziland Protectorate.

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Seasonal Variation in the Rate of Growth of Young Cattle

MANY investigations have been made on the rate of growth in young cattle, and a mass of detailed information on live weights and body measurements has been accumulated[1,2,3,4]. During the period 1927–33 the live weights of all the cattle stock (dairy shorthorns) at the College Farm, Nantcellan, were recorded at approximately monthly intervals, and the data for young cattle have recently been examined. The live-weight curve for the heifers reared for herd replacement has been found to follow that described in Great Britain[1], in the United States[2,3,4,5] and in South Africa[6]. There are, however, two observations from the Nantcellan records which are of special interest. The first of these confirms the findings of Hansen[7] that calves grow faster during the grazing season than when housed. The second is not in accord with Hansen's finding that calves born at the beginning of November do not grow as fast during the first six months as those born at the beginning of April.

(1) There is a seasonal variation in the live-weight gain of young cattle. This is illustrated by a comparison of the summer and winter gains of groups of heifers.