

aerobic cultures of *Bacillus coli*. This throws additional doubt upon the reliability of gas determinations made by the methods in common use.

Based largely upon his results with the Durham tube, Penfold at one time or another has come to the following conclusions:

It may be suggested, therefore, that . . . the selective process has caused the removal of the formic-acid-forming ferment, but apparently has not interfered with the formic-acid splitting ferment.<sup>14</sup>

The power of gas formation from sugars (always excepting isodulcitol) may be lost when gas formation from alcohols is retained. It is probable, therefore, that two different ferments are engaged in the respective processes.<sup>15</sup>

The research raises the question as to the weight to be attached to the power of fermenting glucose and lactose with gas formation in recognizing *B. coli* in routine examinations of pathological material, water, foods, etc. Hitherto, in all authoritative catalogues of the necessary properties of this organism, this has been included, but it probably ought not to be regarded as absolutely essential.<sup>16</sup>

Perhaps more exact work will demonstrate the essential truths there may be in these statements. If so, it will in no wise alter the contention of this article, which is that conclusions of such profound importance are worthy of being established by methods of reasonable accuracy.

It is gratifying to learn that Harden and Penfold have set out to do so. Pending the fuller publication of their results this article would not have been written but for the fact that Penfold since the publication of the preliminary report of Harden and Penfold, has published another paper,<sup>17</sup> in which he seems to have missed the *significance* of the discrepancy between his earlier statement that the variant colon produces no gas from dextrose, and Harden and Penfold's later statement that it does.

<sup>14</sup> Penfold, W. T., *Proceedings Royal Society of Medicine*, Pathological Section, Vol. 4, Part 3, p. 106.

<sup>15</sup> Penfold, W. T., *Journal of Hygiene*, Vol. II., p. 502.

<sup>16</sup> Penfold, W. T., *ibid.*

<sup>17</sup> *Journal of Hygiene*, April, 1913.

Unfortunately Penfold is not alone in the false confidence he has placed in the reliability of the Smith and Durham tube methods of bacterial gas determination. These instruments, which are useful only in the routine laboratory, are still being widely used in elaborate researches; and the time, therefore, seems ripe to emphasize the errors to which their use may lead, and to plead for greater accuracy in this important test of bacteriological chemistry. WM. MANSFIELD CLARK  
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### SPECIAL ARTICLES

#### A NEW MEANS OF TRANSMITTING THE FOWL NEMATODE, *HETERAKIS PERSPICILLUM*

It has been found that *Heterakis perspicillum* may be transmitted to young chicks by a dung earthworm found in horse manure. The earthworm in question is probably *Helodrilus parvus* (Eisen).<sup>1</sup> The experiment demonstrating this relationship was performed during the past summer at the Kansas State Agricultural College. Eleven chicks, as soon as hatched, were placed in a fly-proof field cage and kept there until the close of the experiment. The cage was so constructed that the chicks could not reach chance insects that happened to light upon the outside screen. It had two fly-proof doors enclosing an entry way and the outer door was kept locked. When entering the cage the outer door was closed and the entry inspected for chance flies before opening the inner door. On leaving the pen the same care was taken. All chicks were thrifty and were fed upon the same ration of dry food to which was added twice per day some green alfalfa. It is needless to say that the alfalfa was always examined to prevent any insects from entering the pen. The earthworms were fed to three of the chicks. To the first chick a total of 78 worms was fed in lots of six to twelve each day between July 17 and July 26, inclusive. To the second chick 64 were fed, July 18 to July 29. The

<sup>1</sup> The earthworm mentioned has been referred to Professor Frank Smith, University of Illinois, for identification, and the nematode has been verified by Dr. Albert Hassell, Division of Zoology, B.A.I., Washington, D. C.

third chick received 53 worms between July 19 and July 28. When these chicks were killed September 5, twenty adult *Heterakis* were found in the first, six in the second and two in the third. Eight other chicks, from the same cage and killed at the same time, which had been kept under identical conditions, except that no earthworms were fed to them, did not show a single *Heterakis* present. There appears to be no escape from the conclusion that *Helodrilus* in some way may serve as an intermediate host for this nematode. The experiment does not show the nature of the transmission. Whether it is a case of true parasitism or is simply an association remains to be proved. It may be that the eggs of *Heterakis* simply cling to the more or less slimy surface of the earthworm and are transmitted in this way. Favoring this view is the probability that young chicks can become infected through eating eggs scattered in the feces of older chickens. However, the fact that small nematodes are frequently found in the nephridia of certain earthworms might furnish another suggestive hypothesis. Whatever the exact nature of transmission, the results are interesting. A hen and four young fowls, taken at random from the barnyard where the earthworms were found, were killed and examined for *Heterakis*. Nematodes were present in only two of these. Some of the fowls had the habit of going to the field instead of scratching and wallowing around the manure heap and this perhaps explains why more were not infected. Then the chances are small that any one chick would obtain a large number of earthworms, though the latter were only a short distance below the surface. In any case feeding *Helodrilus* under the conditions described was an efficient means of transmitting the *Heterakis* to young chicks.

JOHN W. SCOTT

UNIVERSITY OF WYOMING,  
September 25, 1913

A NEW SPECIES OF MOROPUS (M. HOLLANDI) FROM  
THE BASE OF THE MIDDLE MIOCENE OF  
WESTERN NEBRASKA

WHILE studying the material representing

the Chalicotheres in the Carnegie Museum in connection with the revision of the superfamily Chalicotheroidea, which is about to be published, the writer has found that a quantity of material representing a specimen from the Upper Harrison Beds of western Nebraska (Middle Miocene) is undoubtedly referable to a new species, which he desires to name in honor of Dr. W. J. Holland, the Director of the Carnegie Museum.

*Moropus Hollandi* sp. nov.

*Type Specimen*.—Radius, ulna, and portion of fore foot, femur, tibia, fragment of fibula, and portions of both hind feet. No. 1424, Carnegie Museum Collection. This material was discovered in 1901 and partially described by O. A. Peterson (*Ann. Car. Mus.*, Vol. IV., pp. 60–61, 1906) as *M. elatus*.

*Specific Characters*.—Limbs slenderer than in *M. elatus* Marsh or *M. petersoni* Holland. Third trochanter of femur somewhat less developed than in the latter species; facet for the trapezium on the scaphoid much reduced, or wanting; facet for trapezium on *Mc. II* wanting; metacarpals proportionally long and slender; proximal and median phalanges of second digit of manus more compressed laterally than in *M. elatus* or *M. petersoni*. The animal was larger than a tapir, but considerably smaller than *M. elatus* Marsh, which was as large as a rhinoceros.

A more detailed description of this species will appear in the work to which reference has been made, the first part of which has gone to the printer.

O. A. PETERSON

CARNEGIE MUSEUM,  
October 8, 1913.

#### THE AMERICAN CHEMICAL SOCIETY ROCHESTER MEETING

##### II

#### BIOLOGICAL CHEMISTRY SECTION

Carl L. Alsberg, *Chairman*  
I. K. Phelps, *Secretary*

T. B. ALDRICH: *On the Presence of Histidine-like Bodies in the Pituitary Gland (Posterior Lobe)*. (Preliminary communication.)

From the Research Laboratory of Parke, Davis & Co., Detroit, Mich. Employing Pauly's diazo-