

the process of mutual enlightenment which *Metron* is intended to facilitate, since the number of readers capable of profiting by the exposition will be larger. The editors hope therefore that questions will be dealt with as their nature permits. But this is merely the expression of a desire not a condition of publication. The editors do not desire to put any compulsion upon contributors or to gainsay those who will forego a numerous audience for the satisfaction of expressing their ideas in the most concise and accurate style.

The sole necessary condition of approval for publication is that papers shall make a contribution to the theory or practise of statistics of original value and likely to interest a greater or smaller number of students of statistics. Contributions will be inserted as articles or notes in accordance with the importance of the subject matter. Frequently statistical researches lead to fragmentary results, insufficient to form the subject of a paper or even a note, but still offering something of scientific interest or perhaps filling a lacuna in other investigations. Such results will be published under a special heading.

In addition to a bibliography of publications received, each number of the review will contain one or more analyses of statistical works or of results perhaps taken from works not exclusively statistical in character. Each such analysis will deal with a particular branch of statistics, *e. g.*, demographic, sanitary, anthropometric or economic statistics. There will also be an analysis of sources and of mathematical work bearing upon statistics (calculus of probabilities, interpolation, etc.).

*Metron* is an international review. As it is published in Italy and consequently a majority of the editorial staff are Italians, no doubt the Italian language will at first preponderate in its pages. But the other great international languages, French, English and German, are admitted to its pages on terms of complete equality. It rests with contributors from other countries to increase their share in its pages and to cause to dis-

appear any such difference. It is the wish of the editors that the participation of non-Italian writers shall become larger and larger.

It is believed that many American workers, in the fields of biology, agriculture, and genetics particularly, as well as statisticians in the narrower sense, will be interested in this new journal and wish to have it in their libraries, as well as to use it as a medium of publication.

RAYMOND PEARL

### SPECIAL ARTICLES

#### FOOT-ROT OF WHEAT

EARLY last spring attention was called to the occurrence of a foot-rot of wheat in Madison Co., Illinois. Since that time I have made a study of the disease assisted at first by Mrs. E. Young True, employed by the Illinois Natural History Survey, and later by Mr. George H. Dungan, of the Illinois Agricultural Experiment Station.

From the first it appeared probable that a certain fungus was the cause of the disease and as early as last June our notes show that this fungus was universally present and that inoculations with pure cultures gave positive results. The evidence is now so clear and conclusive that I venture to present the following facts as fully established.

1. This fungus was isolated by transfer to agar plates from diseased lesions in practically every case where the attempt was made, even when superficial leafy coverings were stripped away and the remaining surfaces disinfected with mercuric chlorid. In all several hundred such isolations were made. Reports from pathologists in other states indicate similar findings there.

2. No other species of fungus or parasite of any kind, was constantly present, or present in any large percentage of cases.

3. The diseased lesions were always penetrated and largely occupied by a fungous mycelium that agrees in general character with the fungus in question.

4. The diseased wheat stems when placed in conditions of suitable humidity become covered with spores of the fungus.

5. This fungus when inoculated in pure culture, either as spores, mycelium or infected wheat tissue, on the unwounded lower internodes of wheat seedlings in moist chambers produced a condition of disease indistinguishable from foot-rot as it occurred in the field.

6. Plants thus inoculated when placed in a moist chamber soon bore numerous spores of the fungus.

7. Wheat planted in soil in pots or benches with an inoculum consisting of this fungus, either as spores or as a pure culture on wheat, developed typical foot-rot.

8. Wheat when planted in infested soil in the greenhouse developed typical foot-rot and when placed in a moist chamber bore the same fungus found so constantly in association with the disease in the field.

9. The fungus in question is a typical *Helminthosporium* as the genus is now understood. It grows luxuriantly on wheat agar, corn meal agar and numerous other media and on autoclaved leaves or stems of various cereals. The spores, observed as grown on autoclaved wheat leaves or stems in humid air, are from 24 to 122  $\mu$  long, the majority of them falling within the limits 80-90  $\mu$  with septa or pseudo-septa varying from 0 to 13, usually about 5-10. The spores are typically thickest in the region about midway between the base and the middle point of the spore, approaching a narrow or broadly elliptical shape, tapering somewhat toward each end. They possess an outer dark wall that is thin and extremely fragile and an inner, colorless, thick wall that is frequently soft, gelatinous. Both of these characters of spore wall seem to be common in several other species of *Helminthosporium*. The spores usually, perhaps always, germinate either from one or both ends, not laterally, and are functionally one-celled.

Further discussion of the morphological and histological features and the relation of this *Helminthosporium* to other species common on cereals will be presented later.

All of the above refers solely to foot-rot as observed and studied in material originating in Madison Co., Illinois, or cultures derived from such material.

It is to be noted that this cereal disease, while of the general type of foot-rot known heretofore in Europe, Australia and elsewhere, is caused by an organism not heretofore designated as a cause of foot-rot in any of the publications on foot-rot in such countries.

The foot-rot found in Illinois, therefore, should be recognized as a disease quite distinct from all others of similar type that have been described previously. It is clear from experimental evidence that it is soil-borne and it is probable that it is also seed-borne. How serious the disease may prove to be, how dependent upon environmental conditions of climate and soil, can be told only after one or more years of additional observation.

F. L. STEVENS

UNIVERSITY OF ILLINOIS,

THE AMERICAN ASSOCIATION FOR  
THE ADVANCEMENT OF SCIENCE  
SECTION E—GEOLOGY AND GEOGRAPHY

*A Biochemical theory of the origin of Indianaitite:*  
W. N. LOGAN.

*Our decreasing natural gas supply:* J. A. BOWNOCKER. A study was made of the natural gas supply from the records of four large companies in West Virginia, Pennsylvania and Ohio. It was shown that the open flow of new wells in West Virginia has decreased 79 per cent. in 10 years; in northwest Pennsylvania 70 per cent. in 7 years, and in southwest Pennsylvania 12 per cent. in 10 years. Changes in rock pressure of new wells are similar. Thus in northwest Pennsylvania there has been a decrease of 37 per cent. in 7 years, and in southwest Pennsylvania a decrease of 34 per cent. in 10 years. In the northern half of West Virginia there has been a decrease of 38 per cent. in the same period. Naturally there has been a proportional decrease in the rock pressure and open flow of all wells. In Ohio the drilling of new territory has kept the averages at a higher figure, but in spite of this the production of gas in the state is decreasing. Ohio gets 60 per cent. of her supply from West Virginia; Pennsylvania about 33 per cent.; Kentucky about 75 per cent., while Maryland and Indiana each draw on the state in a limited way. Manifestly the future supply depends largely on West Virginia. For the two years closing June 30,