Franklin Institute to Dr. Heyl is doubtless a well-deserved honor, but when one reads in SCIENCE for June 28, 1907, on page 1013, that a definitive result is based upon the wholly unproved claim that "the distance of Algol is no less than forty light years" it seems desirable to emphasize the fact that in the present state of our knowledge the approximate distance of any particular fixed star must still be regarded as an unknown quantity.

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ANN ARBOR,
June 30, 1907

SPECIAL ARTICLES

HENS THAT HAVE LAID TWO EGGS IN A DAY

IT is so generally believed that it is not possible for a hen to lay more than one egg in a day that a few observations that show this is not always true may be of interest.

The number of eggs laid by a hen in a year has been greatly increased, the maximum number reported by Professor Gowell, of the Maine Experiment Station, who has for a number of years been breeding to increase the yearly output, being 255. It would seem that there is no known biological reason why the maximum daily rate should be one each day, any more than that the number of eggs per year should be limited to a few broods. In either case the ultimate limit of *possibility* would seem to depend upon the ability of the individual to assimilate and transform the materials taken as food into the materials of the eggs. There may be difficulties that are not understood that would make it impossible to develop a race of hens that would habitually lay more than one egg in a day, as there have been difficulties encountered in getting birds that will lay every day in the year, but *a priori* there seems to be no known biological reason why a hen should not lay more than one egg in a day.

While experimenting on the fertility of eggs it became necessary to keep a daily record of the hens that laid. This was done by means of trap nests that were arranged so whenever a hen entered a nest a door was dropped behind her that not only kept her prisoner until she was liberated by the attendant, but excluded all others. That is, the door was locked so it would not swing in either direction. The ordinary numbered leg bands were used to distinguish individuals. The birds under observation were White Wyandottes.

The latter part of February or early in March, 1906, a pullet that had recently begun laying apparently laid two eggs in a day. Although it seemed a clear case it was not recorded as it was thought possible that a mistake had been made in reading the number on the band. When the same hen again laid two eggs on March 21, record was made and to guard against possible errors in reading the number on the band she was banded on both legs, thus distinctly marking her, as no other hen in the house had two bands.

During March and April there are records of five days on each of which this hen laid two eggs. Although her record was carefully kept for more than a year and a half, there are no other records of her having laid more than one egg in a day. It should be added that the records of days on which she was known to lay two eggs come during the months of her greatest egg-producing activity. In fact it will be seen that in the thirty-three days listed in the following table the hen actually laid thirty-four eggs.

HEN NO. 1. MARCH, 1906

Date	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Eggs.....	1	1	1	1	1	0	1	1	2	1	0	1	1	1	1	1	1	1	2

APRIL

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Eggs...	0	1	2	1	2	1	2	1	1	1	1	1	1	0

During the year and a half over which my observations extend there have been a number of instances of hens laying two eggs in a day, but the records show that in most cases on either the day before or the day after that on which two eggs were deposited, no egg was laid. Such cases may reasonably be accounted for by supposing premature or delayed delivery, but this can not be true of the hen

whose record has been given, where, for the five days beginning with April 3 and ending with April 7, eight eggs were laid.

There are two other instances where an average of more than one egg in a day for a limited period was made. In both of these cases the possible mistake in the reading of the numbers on the bands is to be considered, as the hens had no other distinguishing mark. The records for the particular period for each of these hens follow.

HEN NO. 27. JUNE, 1906

Date	5	6	7	8	9	10
Eggs.....	0	1	1	2	1	0

HEN NO. 203. MAY, 1907

Date	1	2	3	4	5	6	7	8	9	10	11	12
Eggs..	0	1	1	1	1	1	1	2	1	1	1	Set

There are eight other instances recorded where hens laid two eggs in a day but in all of these cases on either the day previous or succeeding the day on which two eggs were laid, no egg was laid.

It should be distinctly understood that these were not double yolked eggs, which are not uncommon. Usually one egg was delivered in the morning and the other in the afternoon. In all of the recorded cases, the eggs were of normal size and shape and in most cases they were tested and found fertile.

It is worthy of notice, but not necessarily significant, that the single pullet hatched last year from an egg laid by the hen whose record is first given, did not make an ordinarily good record this year.

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On the Origin of Limestone Sink-Holes

The following are some of the statements found in texts and other books relating to sink-holes and their origin:

1. It is for this reason [solution] too that Limestone districts abound with funnel-shaped cavities, descending from the surface vertically into the rock, into which water sinks and disappears. They are often called swallow-holes or swallows. Wherever there was any little despression in which water could lodge, the bottom was eaten away lower and lower, and a pipe formed at last leading from the surface into the undeground channel. ("Physical Geology," Part I., by A. H. Green, p. 191.)

2. In regions of soluble rocks, as we have seen, many inequalities of the surface are brought about by the chemical and mechanical action of underground water. Most frequently the depressions caused by the collapse of subterranean galleries and caves contain no water. ("Earth Sculpture," by James Geikie, p. 282.)

3. In limestone regions the solvent action of water has frequently gone on so extensively as to leave its imprint upon the topographic features of the landscape. . . . Entire landscapes are undulating through the abundance of sink-holes — shallow depressions down through which water has percolated and escaped into the underground passages. ("Rocks, Rock-Weathering and Soils," by Geo. P. Merrill, p. 259.)

4. From the surface sink-holes and pipes are dissolved downward, while in the mass of rock caverns are dissolved out, often, as in the Mammoth Cave of Kentucky, many miles in extent and with rivers of considerable size flowing in them. ("An Introduction to Geology," by William B. Scott, p. 89.)

5. It has been estimated that there are in Kentucky 100,000 miles of subterranean channels sufficiently large to permit the passage of a man. Many "sinks" are found on the surface, due to subsidence. ("A Text-Book of Geology," by Albert Perry Brigham, p. 87.)

6. When a considerable area has thus been undermined, the upper rocks may cave in, thus letting down the surface of the land above. Many small lakes in Kentucky occupy such sink holes. ("An Introduction to Physical Geography," by Gilbert and Brigham, p. 99.)

7. Thus across the limestone upland of central Kentucky one meets but three surface streams in a hundred miles. Between their valleys surface water finds its way under-