The writer extends his thanks to all who have made this note possible, particularly to Mr. Brierly for taking the trouble to get the fossils to Worcester.

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THE ANNUAL SCIENCE EXHIBITION

THE Annual Science Exhibition of the American Association for the Advancement of Science will be held this year in the Atlantic City Auditorium, from December 28 to January 1. Already there is assured the most successful performance held thus far. This is the first time that practically all the exhibit space has been taken so far in advance.

Fundamentally the exhibition is a cooperative affair between the scientific workers of the country and those self-supporting organizations that recognize the importance of the science workers to economic betterment.

While the scientists of the country spend nearly a billion dollars a year for personal expenditures and for laboratories and equipment, probably no other class of society has such a diversity of influence on the purchases of the average citizen.

Schuster, in commenting on the influence of the Kelvin galvanometer on the development of modern electrical theory, stated that the progress of science seemed to follow the development of instruments. Certainly laboratories and equipment are vital to scientific progress. The firms and individuals spend much money and effort on the Annual Science Exhibition, and are entitled to the great interest given by the scientists at the annual meetings. This year there will be exhibits from the laboratories of Arthur Compton, Irving Langmuir, Robert A. Millikan, W. F. G. Swann and Harold Urey, among many others. From the instrument firms, industrial establishments and publishers the exhibits will be numerous and better than ever before.

Some individuals of well-established corporations have expressed the desire to keep pertinent knowledge within the corporation. It seems to me that those firms that are willing to exchange knowledge with the scientists have much to gain. Cooperation might enhance the value of promotion methods.

As an example of the interest of the exhibits one of them may be described in detail. The original gondola of the National Geographic Society-U. S. Army Air Corps stratosphere balloon *Explorer II,* a noteworthy collection of scientific instruments and other equipment and a series of eight enlarged photographs depicting the landing of the balloon after its record-breaking flight of November 11, 1935, will be the principal features of the exhibit of the National Geographic Society in Booths 4 and 5.

Due to the size of the Dowmetal gondola, which is nine feet in diameter and the largest of its kind ever built, this part of the exhibit will be placed in the center of the main lounge, opposite the society's booths. All electrical connections, manholes, portholes, landing bumper and primary rigging have been preserved exactly as they were on the day of the flight, when the big globe carried Major Albert W. Stevens and Captain Orvil A. Anderson to a new world's altitude height of 72,395 feet above sea level.

Attached to the side of the gondola will be one of the battery boxes, with its accompanying parachute, and several ballast bags, whose lead shot dust could be released by means of dynamite caps fired from within.

Among the unusual and interesting instruments in the society's booths will be the official meteorograph, which hung inside the big balloon envelope during the flight; the electrical resistance thermometer unit; the official spectrograph, with its wicker basket and parachute; the oblique and vertical cameras, and the compass.

The valve in the top of the balloon, which was operated by compressed dry gas through 400 feet of small rubber hose, will also be shown, as well as the special electrically heated gloves taken into the stratosphere by the two flyers.

In addition to the series of eight enlarged photographs of the landing of the huge balloon near White Lake, South Dakota, there will be an enlargement of a vertical photograph taken from the gondola at the highest altitude (72,395 feet) while over Parmelee, South Dakota.

A scale model of the gondola, with miniature representations of the instruments and equipment, will reveal the appearance of the interior of the floating laboratory on the day of the flight. Appropriate legends will give facts about the purpose, size, weight or construction of each item, as well as information about the balloon, gondola and rigging.

Singularly appropriate is the addition of the flag of the National Geographic Society, whose three colored bars, blue, brown and green, represent the sky, the earth and the sea. The society's flag has been carried by expeditions under the society's auspices to the greatest altitude reached by man, to the North and the South Poles, as well as the greatest depth under the sea.

The affiliated societies have very generously proffered to print items of interest about the next exhibition at Atlantic City. It is hoped that the spread of advance information will increase the attendance and enhance the color of the meetings and extend the usefulness of the association. It is hoped that advantages of registration will be so apparent that members

will register early. The admission to the exhibition will be simplified if members will wear their badges. The attendance is growing so rapidly that it is becoming more imperative to make the exhibition for the membership. However, members will be entitled to bring in the members of their families.

F. C. BROWN,
Director of Exhibits

SPECIAL ARTICLES

OVUM AGE AND THE COURSE OF GESTATION IN THE GUINEA PIG[1]

IN domestic mammals, as the horse,[2] the cow,[3] the ewe,[4,5] the sow[6] and the guinea pig,[7] in which ovulation is spontaneous, it has been found to occur late in the period of heat or even shortly after its end. As a result ova ordinarily are not compelled to await the arrival of the spermatozoa. Whatever waiting is necessary usually falls to the lot of the male cells. That this arrangement may not be without significance is indicated by the lowered fertility of the sow,[6] the ewe,[8] the rabbit[9] and the ferret[10] mated shortly before or soon after ovulation and by the abnormal development of aged sea urchin eggs.[11]

In our studies of the structural and behavioral changes at oestrus in the guinea pig it has been convenient to investigate the relationship between ovum age and the course of gestation and development in this species. A complete report can not be given until preparation and study of the abnormal embryos we have recovered has been possible. In the meantime, though, certain data bearing upon the relationship between ovum age and the course of gestation have accumulated and because of their importance for problems in embryology and the physiology of reproduction they are being reported now.

Exclusive of 21 animals which did not survive the period of pregnancy, 235 individuals were inseminated artificially with spermatozoa freshly removed from the epididymides of normal males and placed in Locke's solution at room temperature. Of these, a control group of 45 were inseminated during heat and prior to ovulation. The remainder were inseminated 18, 24, 30, 36 or 42 hours after the beginning of oestrus, which may safely be assumed to be about 8, 14, 20, 26 and 32 hours respectively after ovulation.[7]

Following insemination the animals were examined twice daily for open vaginal membranes, which usually indicate that impregnation has not occurred, or for bloody vaginal orifices, which have been found to indicate that fetal death has occurred and gestation is to be terminated prematurely. When an instance of the latter was detected the female was killed immediately and the uterus with its contents and the ovaries removed for examination, fixation and subsequent microscopical study. Except for the individuals that were killed because of an abnormal pregnancy, no animal was removed from the colony until the last litter was born. This precaution enabled us to avoid errors of diagnosis in the few cases in which the vaginal membrane opened despite the presence of normal fetuses.

The percentage of impregnations, abnormal pregnancies (embryonic death within the first 20 days, later fetal death followed by abortion before the 66th day and stillbirths at full term) and normal pregnancies are given in Table I. In addition, the average

[1] This investigation was supported by a grant from the Committee for Research in Problems of Sex, National Research Council.

[2] W. A. Aitken, *Vet. Pract. Bull., Iowa State Coll.*, 8: 178, 1926.

[3] J. Hammond, "Physiology of Reproduction in the Cow," Cambridge University Press, 1927.

[4] E. Allen, F. F. McKenzie, J. W. Kennedy and W. K. Beare, Abs., *Proc. Am. Assoc. Anat., Anat. Rec.*, 48, Suppl.: 9, 1931.

[5] J. Quinlan and G. S. Maré, *17th Rept. of the Div. of Vet. Services and Animal Indust., Union of S. Africa:* 663, 1931.

[6] L. L. Lewis, *Okla. Agric. Exp. Sta. Bull.*, No. 96: 3, 1911.

[7] H. I. Myers, W. C. Young and E. W. Dempsey, *Anat. Rec.*, 65: 4, 1936.

[8] J. Quinlan, G. S. Maré and L. L. Roux, *18th Rept. of the Div. of Vet. Services and Animal Indust., Union of S. Africa:* 813, 1932.

[9] J. Hammond, *Jour. Exp. Biol.*, 11: 140, 1934.

[10] J. Hammond and A. Walton, *Jour. Exp. Biol.*, 11: 307, 1934.

[11] A. J. Goldfarb, *Biol. Bull.*, 35: 1, 1918.

TABLE I

IMPREGNATIONS, NORMAL PREGNANCIES, ABNORMAL PREGNANCIES AND LITTER-SIZE FOLLOWING INSEMINATION BEFORE AND AFTER OVULATION

Time of insemination	Number of inseminations	Impregnations	Normal pregnancies	Average litter-size	Abnormal pregnancies	Average number of recovered embryos
During oestrus	45	36 or 80 per cent.	32 or 89 per cent.	2.7	4 or 11 per cent.	2.0
18 hrs. after beginning ...	37	21 or 57 " "	12 or 57 " "	2.0	9 or 43 " "	2.2
24 " " "	41	20 or 48 " "	5 or 25 " "	2.2	15 or 75 " "	1.5
30 " " "	49	16 or 32 " "	3 or 19 " "	1.3	13 or 81 " "	1.6
36 " " "	42	4 or 9.5 " "	0 or 0 " "	0.0	4 or 100 " "	1.0
42 " " "	21	0 or 0 " "	.....	...	.....	...