line. The next step would be to use the tarry products from petroleum distillations for the same purpose. And finally would come the use of coal dust itself.

While America has not the immediate economic pressure for starting coal dust gasoline research, a decade hence the situation will be different. Government scientists, foreseeing this day, are itching to get at the preliminary work so that when the time comes they can present a whole program to relieve the problem. At present what work has been done in the United States has been mainly in university laboratories, so much so, in fact. that the problem is principally of academic interest.

Science News Letter. April 13, 1935

ZOOLOGY

Efforts to Grow Baby Rabbits in Glass Fail

Attempts at Ectogenesis Are Temporarily Checked Because Hormones Act Only Through Mother's Body

ATTEMPTS at ectogenesis or "babies born in a bottle" have been checked, temporarily at least, because certain hormones necessary to the early growth of the egg and embryo act only indirectly through the mother's tissues.

Discovery of how these four essential hormones act was made by Prof. Gregory Pincus of Harvard University. Prof. Pincus' success in fertilizing rabbit eggs in a test tube, announced last year, attracted wide notice as a first step toward ectogenesis, a process long dreamed of by romantically-minded scientists. In this earlier experiment the eggs were fertilized in a test tube and then brought to birth within the body of a foster mother rabbit. (*SNL, March* 10, 1934)

His latest efforts were directed toward the next step, continuous growth of the eggs and embryos outside the mother, a feat as yet unaccomplished by scientists. Prof. Pincus tried to do this by adding certain gland products to the material in which the eggs were placed for growth outside the mother's body.

These are thyroid and pituitary hormones which affect the maturing of the egg in the ovary; oestrin, a primary female sex hormone affecting the later growth of the eggs; and progestin, a female sex hormone affecting the growth and implantation of the eggs in the walls of the uterus.

Allowing the egg to develop normally and removing it from the mother's body after it had become implanted on the walls of the uterus, Prof. Pincus succeeded in keeping the embryo alive in a culture dish for about 48 hours. At this stage blood vessels began to form and the heart began beating but all attempts to keep the embryo alive beyond 56 hours after separation from the mother failed.

Adding to the culture the hormones which brought the embryos through the same periods in the mother's body was also unsuccessful.

From the fact that the cultures still die at the same critical points, even after the hormones had been added to their nourishing growth medium, Prof. Pincus concluded that the hormones act on the eggs and embryos through the maternal tissues rather than on the eggs directly.

Prof. Pincus' attempts to grow the eggs outside the maternal body failed at the critical point in the development which has blocked previous attempts by other scientists. Normal cleavage of the cells followed fertilization and continued until 128 cells were formed.

At this point, when a cavity is ordinarily formed within the ball of cells and the embryo begins its growth, development outside the mother's body became abnormal and the entire organism collapsed with irregular growth.

Further efforts to perfect a culture which will allow the eggs to get past the critical stage at which science is now stopped are progressing along three lines. In the first, the mother is injected with each of the hormones and the effects on the egg studied. Varying strengths of solutions of the hormones are being added to the cultures to learn possible effects in another method. Still a third line of attack takes the eggs placed in cultures or those of injected mothers and places them in new mothers. Results of these efforts are not yet available, since the research has just begun.

While other scientists have conducted research on the effects of sex hormones on female reproductive organs, Prof. Pincus' experiments are among the first to study the effects of these hormones on the egg itself.

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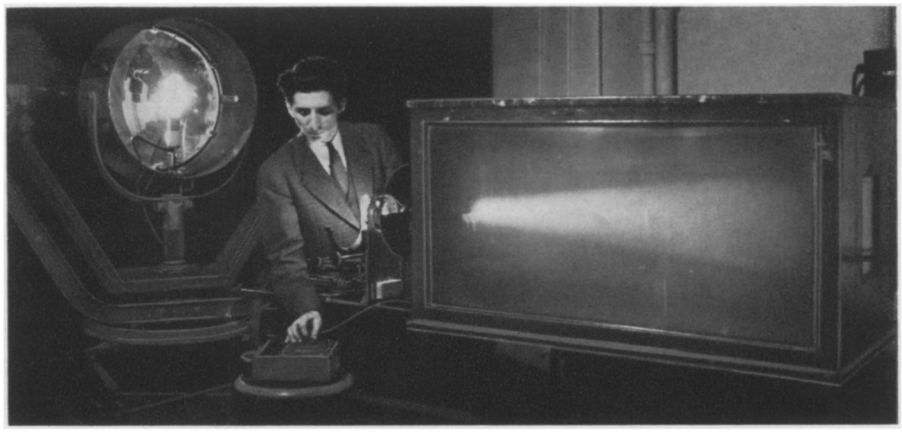
PHYSICS

Lamps "Work Themselves To Death" to Overcome Fog

FOG, worst enemy of seafaring men approaching harbor, can be fought with a new weapon now. What and how, was described before a joint meeting of the American Physical Society and the Optical Society of America, in session at Columbia University.

The new trick in fog-conquering is to operate the electric lamps in lighthouses at much more than their normal voltages during foggy periods. Gjon Mili, engineer of the Westinghouse Electric Lamp Company, disclosed that the bureau of lighthouses, U. S. Department of Commerce, has been



TESTING FOR LIGHTS

Gjon Mili is measuring, with a foot-candle meter, the intensity of light passing through a chamber filled with fog in the laboratory of the Westinghouse Lamp Company.

making extensive tests with such over-voltage lamps. Working with lamp engineers, the lighthouse bureau's experimenters have already proved that in a fog where one can see the light for only 400 feet, it is possible to increase the visibility of a lighthouse lamp or airway beacon to six times that distance, 2,400 feet, and that this feat is possible without changing the small, fifty-candlepower lamp now used.

The new line of attack on the fog problem, Mr. Mili said, came about because of past failures with various experiments to get added light transmission with colored beams.

"For years," he stated, "engineers sought a new source or color of light that would penetrate fog at a distance safe for aerial and marine navigation. Only recently, however, have engineers thought to increase the brightness of marine signal lamps by operating them over-voltage and utilizing reflectors and lenses to intensify the candlepower in the light beams.

Working lighthouse lamps at higher than the normal 110 volts as used in the home cuts down the life of the lamps, which is now standard at 1,000 hours. In the interest of economy, lamps should be operated at their normal rating of voltage, but in the interest of safety to human life and property engineers have come to the conclusion that they might well be made to shine brighter during fog intervals, even at the expense of a reduced life period.

With a fifty-candlepower lamp a slight step up in the voltage makes it emit 500,000 candlepower. Beams of upwards of 1,000,000 candlepower can be obtained from present type lamps by over-voltage and properly designed reflectors, Mr. Mili said.

It is possible, he continued, to work out compact auxiliary apparatus for lighthouse lamps whereby they will run at normal or subnormal voltage in clear weather and "work harder" during fog periods. This would even be possible on light-buoys far from shore, which operate on batteries.

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PSYCHIATRY

Research Will Add to Present Knowledge of Mental Disease

SHUT off from the world of normal persons by a thick curtain of ignorance are over 150,000 unfortunate men, women and children. They are the victims of mental disease, specifically of that most common and most tragic of all mental ills, *dementia precox*.

Striking its victims just as they are attaining maturity, this disease dooms most of them to a lifetime of wretched existence. Only about two out of every hundred afflicted recover sufficiently to take their places again in the world of the sane. The rest languish in institutions, growing more and more feeble mentally until they reach a stage of almost complete mental deterioration and general helplessness.

The curtain that shuts these unfortunates off from the rest of the world is our ignorance: ignorance of what goes on in their troubled minds—because at first they will not and later cannot tell us—and ignorance, consequently, of how to help them or of how to ward off the disease in susceptible persons.

Hope of getting behind this curtain of ignorance lies in research. Some studies are already being conducted at various institutions throughout the country where the unfortunate sufferers from *dementia precox* are confined.

Merely supporting and caring for these helpless patients, however, is so great a burden that very little money has been available to finance scientific study of their condition and investigation of its causes.

It now appears that scientists may get behind the curtain faster and more quickly find the ropes to lift it. A fundamental attack on this most baffling problem of mental medicine is being launched thanks to the far-sighted benevolence of the Scottish Rite Masons of the northern jurisdiction of the United States. A preliminary fund of $15,000 has been established to begin the work and more will be made available during the coming year.

Plans call first for locating the scientists, hospitals and laboratories already engaged in research in this field with a view to supporting promising research that is already under way or of finding fresh leads for study and likely persons to engage in new projects. This preliminary survey of the field is being made by Dr. Nolan D. C. Lewis, who is on leave from St. Elizabeth's Hospital, Washington, D. C., for this purpose. Dr. Lewis has for many years been director of laboratories at this large government institution for the care of the mentally ill.

The initial $15,000 fund is to be administered by the National Committee for Mental Hygiene. The entire project is in charge of a special committee composed of some of the foremost American leaders in the field of mental disease.

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ZOOLOGY

Male Horses Speedier Than Mares and Fillies

PUT your money on geldings or stallions rather than mares and fillies when the race is an open competition.

The best of the females is still inferior to the best of males in running ability, says Prof. Calvin P. Stone, Stanford University (*Journal of Comparative Psychology*, Feb.) Prof. Stone studied the sex differences in the speed of thorough-bred horses from the records available for the years 1908 to 1932 inclusive.

In the stake races, which are crucial tests of speed, stamina and racing temperament, he found that only 22 per cent. of the winners were females during the period 1923 to 1929, when 2,400 consecutive stake races were run on the best-known American tracks. This figure is still too high, because some of the races were restricted to one sex. In 1932 mares and fillies won 24 per cent. of all the races but only 19 per cent. of those in open competition with male. The ratio of 1:4 properly indicates the relative frequency of winning by males and females in this type of race.

Apparently when records are made the male horse is far more likely to make them, for 86 per cent. of all racing records established from 1908 to 1932 were made by stallions and geldings. Fifty distances from one quarter to four miles were studied. Moreover, when it comes to running a mile in less than one minute and 37 seconds, a performance that has only been done 170 times during this period, it was found that 138 of these records, or 81 per cent., were made by males.

No female has ever run a mile in 1:35 or less, whereas four males have achieved this impressive speed. Equipoise did it in 1:34.4 with an impost of 128 pounds. The female impost is nearly always lighter than the male.

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