Regardless of the arc which the swing describes, the time interval required for it to pass through its starting point is the same. So it is with the semi-circles described by the atomic "bullet." In each excursion, regardless of an ever-increasing radius, the oscillating "bullet" reaches the gap separating the two disks in a period of time which is constant. It is this physical principle which gives to the apparatus its resonance feature."

Science News Letter, January 25, 1936

RADIO-AVIATION

New Aviation Radio Receives 2 Signals on Same Frequency

NEW radio aid for commercial aviation is under test in Pittsburgh, Pa., which consists of the transmission of both voice and radio range signals on the same frequency. The two sets of signals are received simultaneously in an airplane—directional signals operating a needle pointer on the instrument panel and the voice signals being received in headphones.

The new development solves the problem, existing for some time, that directional beacon signals and the weather reports went out on the same radio frequency, and thus one had to be interrupted for the other.

The limited number of frequency channels available and the need for the simplest possible receiving equipment required such interrupted service in the past. With both weather and range directions on the same frequency, the pilot did not need to change dial settings on his receiver.

The old system, while simple, had its handicaps. If a pilot was flying blind and attempting to locate an airport, it was disconcerting to have the directional signals interrupted by a weather broadcast which told him it was raining or foggy in his vicinity. He knew that anyway, otherwise he would not be flying blind.

In a minor aspect the weather signals delayed his landing and in a major case might delay him at a time when the ceiling at the airport was lowering to zero-zero conditions.

Before the new development the Bureau of Air Commerce sometimes postponed weather information for a short while and kept the directional signals on the air continuously when requested by pilots.

This system also had its handicaps, for weather reports might be needed by other pilots, and planes with receivers but not transmitting equipment might need continuous directional signals and not to be able to request them.

The new development of receiving two signals on the same frequency solves all these problems.

Science News Letter, January 25, 1936

CHEMISTRY

"Alloy" Oil Promises Changes In Motoring Upkeep Costs

"ALLOY" oil, three times stronger than ordinary petroleum used in motor cars, is the latest answer of oil engineers in Philadelphia to the demands of increased lubrication pressures inside modern automobiles.

Alloy oil consists of 99 per cent. petroleum and one per cent. of a chemical relative of phosphoric acid.

In tests with stock cars driven the equivalent of ten years of average motoring, the new alloy oil markedly prevented wear. Measurement showed less wear than is usual for one-tenth the 100,000 miles traveled, according to Dr. T. G. Delbridge, research director of the Atlantic Refining Co.

Significance is attached to the successful development of an "alloy" oil which obtains strength without sacrifice of any other essential lubricating qualities, for the reason that the sharp reduction in engine wear effected by the new oil may permit important changes in motor design and possibly the use of new metals. This in turn may lead, in the opinion of auto engineers, to a reduction of production costs during the next decade. The wear reduction effected by the high film strength oil is alone estimated to permit a cut in national motor upkeep costs of at least $50,000,000.

"It is proper to ask," Dr. Delbridge remarks, "whether the decrease in wear made possible by this high film strength motor oil may not have effects equal to those in the building and manufacturing industries when steel was created. Any substantial reduction in the costs of operating automobiles increases the number of people who can afford to own and operate cars."

In engineering circles the development of an effective "alloy" oil is considered significant for the reason that a crisis has long been foreseen when the strength of natural petroleum, no matter how well refined, would be inadequate to meet the increasing heat, pressure and speed of moving parts developed by the high compression automobile motor. Search for an effective "alloy" oil has been carried on for some years. The problem has been to find a substance which would increase the film strength of petroleum without reducing its effectiveness in other respects.

The strengthening chemical added to natural petroleum is known technically as the non-chlorinated ester of phosphoric acid.

Science News Letter, January 25, 1936

DENTISTRY

Chemical Test May Lead to Preventing Tooth Decay

DECAY of the teeth with attendant toothaches may be prevented in the future, if a method developed by Dr. E. P. Brady of the Washington University Dental School, St. Louis, is put into successful practice.

A dental examination can determine by a chemical test which of the teeth in one's mouth are liable to decay, says Dr. Brady. Silver nitrate, a common chemical used generally for germ killing purposes, betrays the presence on the tooth enamel of certain faults of formation. It is in these faulty areas that decay is likely to start, because there the acids in the mouth and acid-producing bacteria can penetrate through the enamel to the sensitive dentine beneath.

The decay can be prevented by the use of silver nitrate, Dr. Brady said.

After it has started, its progress can be stopped by use of another chemical

called trichloracetic acid, Dr. Brady said. This substance acts to coagulate the organic material in the tooth and block any further penetration by the acids of decay into the interior of the tooth.

Nature has her own way of doing just this, under favorable conditions. When decay starts, a defense may be made in the form of a barrier of calcium deposit across the path of the penetrating acids. In laboratory tests, it has been found that acid strong enough to destroy all the rest of the tooth, will leave that defensive calcium deposit.

Science News Letter, January 25, 1936

MEDICINE

New Insulin Treatment Makes Diabetic More Nearly Normal

Supplement to Ordinary Insulin Promises To Make Adjustment of Carbohydrate Balance Easier for Some

THE "most valuable discovery in the treatment of diabetes since the original discovery of insulin" is announced in *The Journal of the American Medical Association.* (January 18)

A new preparation—protamine insulinate—is the answer found by Danish investigators to the problem of the many persons with a severe diabetes which cannot be controlled satisfactorily with insulin alone.

Protamine insulinate does not supplant ordinary insulin in the treatment of diabetes but serves as an adjunct to it. The two must usually be used in the same patient at different times each day.

For example, a person with diabetes can employ the quickly acting old insulin in the morning with a heavy breakfast and the slowly acting compound at night before a light dinner.

That is what has been done at the Steno Memorial Hospital, Copenhagen, Denmark, where Dr. H. C. Hagedorn and his associates have developed the new preparation. A similar procedure is being followed by Dr. Howard F. Root and associates at New England Deaconess Hospital, Boston, where the new preparation is also being tested.

"It would appear as if a new revolution in the treatment of diabetes must follow and the possibility created for the diabetic patient to resemble more closely a normal individual," writes Dr. Root and his co-workers, Drs. Priscilla White, Alexander Marble and Elmer H. Stotz.

"While the majority of persons with diabetes are able to adjust their carbohydrate metabolism satisfactorily by the injection of insulin several times a day, many have so delicately balanced an equilibrium that it is readily disorganized by slight overdosage or underdosage of insulin," the *Medical Journal* explains. "Wide fluctuations in blood sugar occur in these patients."

The Danish investigators have combined insulin with protamines, which are elementary compounds of amino acids containing one or more of the substances lysine, arginine and histidine. The resulting compound is relatively insoluble and tends to be absorbed slowly and over a longer time than ordinary insulin. The blood sugar lowering effect lasts about twice as long.

In presenting the work of both the Danish scientists and of Dr. Root and his associates in Boston, *The Journal of the American Medical Association* emphasizes several facts:

Protamine insulinate is still a laboratory preparation and is not yet commercially available.

The compound is somewhat inconvenient in that it must be prepared shortly before use, as it is stable at most for only a few weeks.

It does not supplant insulin but serves as an adjunct to it.

It is of no special value to persons who are now adequately treated with insulin.

Fifteen cases treated in Boston in general confirm the excellent results reported in the eighty-five cases reported from the Danish hospital.

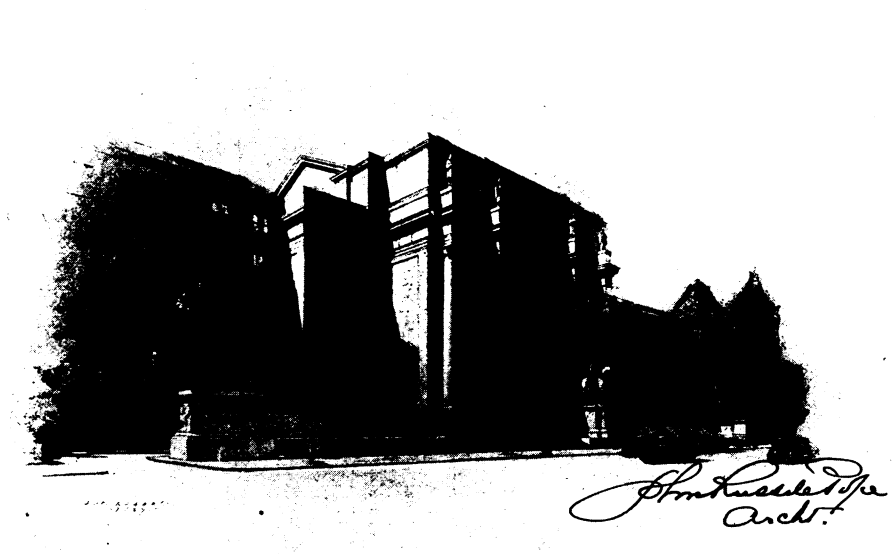
Science News Letter, January 25, 1936

ZOOLOGY

Roosevelt Memorial Hall Honors Love of Wildlife

WILDLIFE in all its phases has an inseparable connection with the name Roosevelt. As legitimate quarry for hunting, as a vital part of the national heritage to be conserved against the effects of too much civilization, as a life-complex worthy of scientific field study, wildlife has long had the close attention of members of this most prominent American family.

Roosevelt significance to wildlife is brought to a new focus with the dedication of the New York State Roosevelt Memorial at the American Museum of Natural History in New York City, which took place on Sunday, Jan. 19. In this new great hall, appropriately near the hall dedicated to his friends and collaborator, the late Carl Akeley, Theo-



NEW YORK STATE ROOSEVELT MEMORIAL