

had developed a sense of inferiority because of their excessive fatness which kept them from engaging in the usual activities of their group, lost this attitude and became normal healthy children with an active interest in their surroundings.

Examination revealed no evidence of

disturbance of the ductless glands as a cause of obesity, and the steady loss in weight under dietary treatment confirms the belief of the authors, as of other observers on obesity, that overweight is usually due not to gland disturbances but to over-eating plus under-activity.

*Science News Letter, November 30, 1935*

## PHYSICS

## Rotors Whirling at 16,000 Miles an Hour for Atom Study

### Scientific Counterpart of the Cream Separator Used To Separate Heavy Isotopes from Lighter Ones

**T**HE CREAM separator, that takes cream out of milk by high-speed whirling, has a smaller but vastly faster scientific counterpart in a 16,000-mile-an-hour centrifuge at the University of Virginia. This device, which develops a centrifugal force equivalent to seven million times gravity, is to be used in an effort to separate chemical isotopes, which are different-weight atoms of the same chemical elements.

Reporting to the National Academy of Sciences meeting, Dr. J. W. Beams, University of Virginia physics professor, told of adapting his high-speed air-driven apparatus to the new highly important atom problem.

Dr. Beams' rotor device can spin in a vacuum and attain velocities as high as 21,000 revolutions a second, or a rim speed of over 16,000 miles an hour. At these speeds the centrifugal forces produced are in excess of seven million times the force of gravity.

The only limit to the speed of rotation, Dr. Beams indicated, is the strength of the rotor. Under the great centrifugal force, the spinning metal may fly apart.

So hazardous is the research with little four-inch diameter rotors that it is carried on behind a barricade consisting of a wall of sand four inches thick held in place by 1½-inch thick wood planks. For larger rotors, still more protection is needed.

Describing the separation of isotopes, Dr. Beams said:

"Because of the new methods recently found by many different experimenters for disintegrating the atoms, it is very important to obtain samples of the various pure isotopes so that the results of the atomic disintegrations can be clearly analyzed. At the present time we are undertaking this problem of separating isotopes, and the method is brief-

ly outlined although no results are as yet ready to be reported.

"Isotopes have the same atomic number but different atomic weights. Therefore in a centrifuge the heavier isotopes settle out under the intense centrifugal force faster than the lighter ones.

"In addition to separation by centrifuging, the rotor is made to select the heavier molecules of a gas or vapor directly. This is easily accomplished because the velocity of a molecule depends upon the square root of its mass. Since the peripheral velocity of the rotor can be made greater than the average molecular speed of most substances, the rotor can easily be set at such a speed that, roughly speaking, only the faster (lighter) molecules can enter a hole on the periphery."

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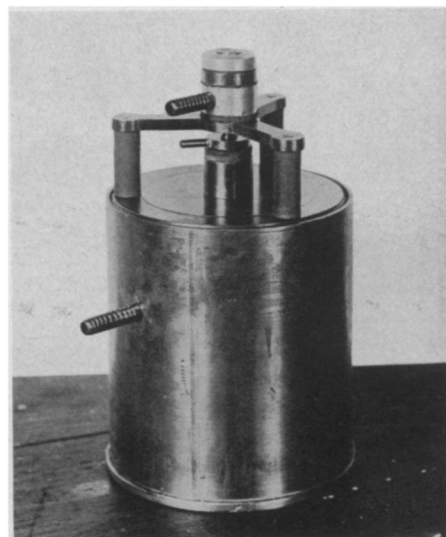
## ENTOMOLOGY

## New-Found Ant Species Are "Racketeer" Aristocrats

**P**ARASITIC ants of a new species, recently discovered in southern Germany by Dr. Karl Gösswald of the Institute for Applied Zoology, Munich, set a new record for insect racketeering. If Solomon could have seen these insects, he might have hesitated about making a blanket commendation of ants in general as models of industry and thrift.

This ant's career of wickedness begins when a fertile queen intrudes herself into the nest of another species of ant—the normal, hardworking kind that inspired Solomon's praise. Ordinarily the workers in the nest would make short work of any stranger, but she somehow manages to flatter herself into their good graces.

Proceeding thus unmolested to the



## LOOKS INNOCENT

*But the rotor within this housing, whirling at 16,000 miles an hour, produces such centrifugal force that the metal may fly apart. Scientists working with it "take cover" behind a barricade of sand.*

chamber of the rightful queen, the invader springs upon her back and fastens her strong jaws into the body of the much larger insect. The home queen does nothing to defend herself, and the workers still pay no attention.

After the rightful queen is dead, the invading queen is accepted by the duped workers as their own. She proceeds to lay eggs of her own parasitic species, which are cared for by the workers.

These eggs produce "neuters" or undeveloped females, which in a normal ant species constitute the worker caste. But in this parasitic species they are as useless as their mother, living lives of complete idleness, accepting the food the active workers bring them and giving no thanks for it—as typical a lot of alien aristocrats as ever afflicted a community, whether ant or human.

It might be expected that when the last of the workers had died off, the helpless parasites would perish. But here the nature of the "host" ant workers intervenes to play a mean trick on them and perpetuate their slavery.

Normally, when an ant colony loses its queen, some of the usually "sexless" workers lay unfertilized eggs, just as worker bees do under similar circumstances. Such unfathered bee eggs develop only male or drone insects, useless as workers. But with these poor afflicted ants, the eggs laid by the workers produce new workers, so that the "aristocratic" idle parasites always have a full population of exploitable "proletariat" workers to take care of them.

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