

found unsatisfactory for criminological examination because they involved the use of blocks, which the defendants thought silly.

In part of his test Dr. Selling uses three types of formal psychiatric tests: the group intelligence test, the neurotic inventory, and a standardized inventory of special abilities or traits.

Sex offenders are the hardest to examine, Dr. Selling said. Unless much care is taken, these will seldom give enough information to enable the physician to get a real understanding of the case. About 85 per cent of these at the beginning of the examination deny categorically that they have committed the crime of which they have been convicted.

Glands May Make Children "Bad"

When a boy, or girl, is so "bad" that his behavior constitutes a problem, the fault may lie with the child's glands of internal secretion. About one-fourth of the boys in an institution for delinquents had some disorder of the endocrine glands, Dr. Matthew Molitch of Jamesburg, N. J., reported. This suggests, in Dr. Molitch's opinion, that there may be some relationship between behavior problems and the endocrine glands, and shows the need for further study.

The pituitary gland, important director of body activity, was functioning abnormally in almost half of the boys Dr. Molitch described. These boys were either too short or too tall for their age. Some were overweight and some were tall, thin and weak. Some had delayed sexual development. A small group had underactive thyroid glands. The intelligence of the entire group showing glandular disorders was not very different from that of the other boys in the institution, but the boys with glandular disorders were more unstable and troublesome than the rest.

Breathing Reveals Personality

The manner in which a person breathes is as characteristic as his handwriting, Dr. Franz Alexander of Chicago told the meeting.

The fact that emotions influence breathing, excitement sometimes making a person breathe faster, for example, is well known. With Dr. Leon J. Saul, Dr. Alexander investigated this, examining the manner of breathing of 300 mentally sick patients and of normal persons and patients suffering from diseases other than mental.

They found, among other things, relationships between a pause in breathing and a certain type of neurotic reaction;

between slight interruptions of breathing and digestive tract disturbances; between still another type of breathing, characterized by inspiratory spikes on the charted curve of breathing, and certain poorly repressed, unconscious desires.

Is there a really normal person and, if so, where is he?

This question was raised by Dr. L. W. Darrah of the Gardner, Mass., State Colony.

If such a paragon as the normal person does exist, he would probably be a

mediocre, uninteresting chap, it appears from Dr. Darrah's remarks. All the glib talk about "normal minds," "acting normally," or "doing things in a normal way," has little meaning, since no one apparently knows just what "normal" is. Almost everyone, Dr. Darrah pointed out, seems to have an idea of what an abnormal person is, but no one has tried seriously to describe or define the almost mythical normal person. Many textbooks do not even list "normal" in the index.

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PHYSICS

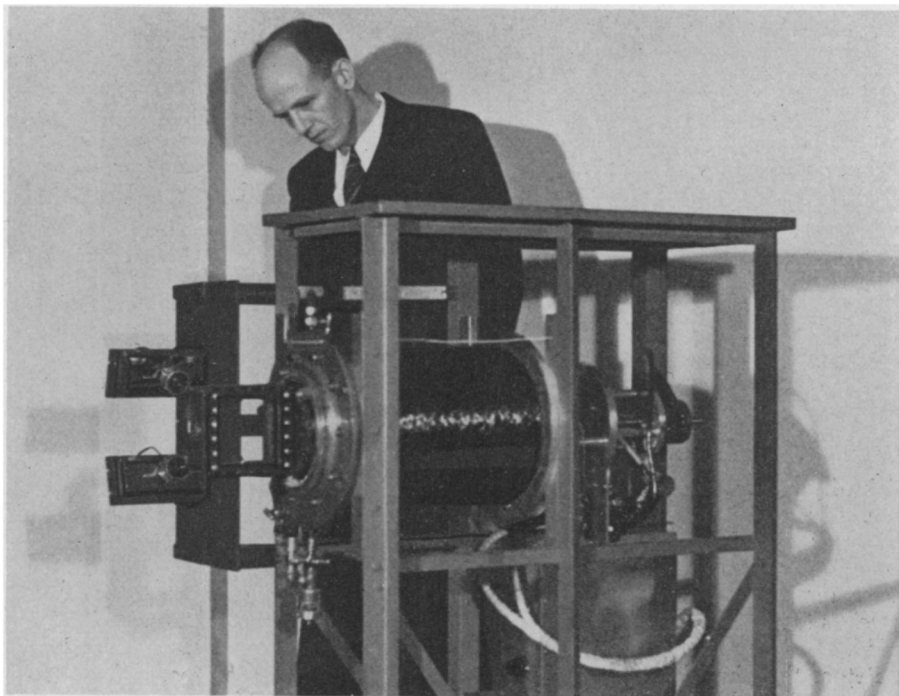
New Design of Cloud Chamber Cuts Weight over 900 Pounds

THE WILSON cloud chamber apparatus, which is one of the most potent tools of science for taking actual photographs of the breakup of atoms, has been redesigned into an instrument which weighs only 76 pounds, declared Dr. Gordon L. Locher of Bartol Research Foundation of the Franklin Institute before the American Physical Society. Hitherto, cloud chamber apparatus have been unwieldy, heavy instruments weighing hundreds and even thousands of pounds. It was in such an instrument

that Dr. Carl Anderson first discovered the new atomic particle, the positron.

Dr. Locher's variation of the famous instrument was designed for the stratosphere flight of Dr. and Mrs. Jean Piccard. He constructed a similar one for the last stratosphere flight of the Explorer II of the National Geographic Society and Army Air Corps. It is semi-automatic in operation and is made of lightweight DOWMETAL.

The new lightweight instrument should find wide use in studies of



LIGHTWEIGHT CLOUD CHAMBER

nuclear disintegrations and cosmic radiation, especially in balloon flights and for observations on high mountain peaks where it is with only the greatest of difficulty that the ordinary, heavy type of equipment can be set up.

Dr. Locher expressed the belief that one of the greatest benefits to be derived from cosmic-ray studies will be the eventual correlation of cosmic-ray nuclear disintegrations with those produced

by laboratory means. He showed cloud chamber photographs of some of the 185 cosmic-ray disintegrations he has obtained in paraffin, boron, and lead. Those from paraffin show paths of massive nuclear particles that do not resemble anything produced by radioactivity or by laboratory disintegrations. An explanation of their origin awaits further investigation.

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PHYSICS

New Electric Device Detects Distances Less Than Atom Size

Intense Audible Sounds Found to Produce Light, Physicists Are Told; Eruptions in Atoms Described

SCIENCE'S first chance to make measurements directly of individual atoms, which are the smallest particles of the elements, promises to come from a new ultra-precise measuring instrument.

An electric ultramicroscope capable of detecting displacements of less than a billionth of an inch with an accuracy to a few per cent was described at the American Physical Society meeting in Washington by Prof. J. C. Hubbard of The Johns Hopkins University. It is believed the apparatus will be applicable to studies of atoms by direct observation.

The detecting apparatus, said Prof. Hubbard, is an electrical circuit containing a quartz plate resonator roughly similar to those used in broadcast transmitters for controlling the frequency of radio signals.

The quartz plate, in the fashion used by Prof. Hubbard, is extremely sensitive to small frequency changes. "A number of applications of this sensitivity to frequency variation suggest themselves," declared the Johns Hopkins professor, "perhaps the most interesting applying to measurement of small displacements of an ultramicroscope plate in the exciting circuit."

Ten-Billionth of an Inch

Displacements of 10^{-9} cms. (less than a billionth of an inch) have been measured to a few per cent, the accuracy depending upon the absence of mechanical disturbances. By suitable mechanical insulation it is expected that displacements less than one ten-billionth of an inch may be measured.

"Such distances," Prof. Hubbard explained, "being much smaller than the dimensions of individual atoms, it is believed that a number of problems of great interest in atomic and molecular physics will now be open to study by direct observation."

Eruptions In Atoms

A phenomenon corresponding to microscopic volcanic eruptions in bits of tungsten ribbon covered with thorium, and used in vacuum tubes, has been discovered at the Bell Telephone Laboratories, New York City.

In reporting to the American Physical Society, A. J. Ahearn and J. A. Becker described their studies of these thorium eruptions with an electron microscope.

On heating the thoriated tungsten filaments to temperatures as high as 4,000 degrees Fahrenheit, the Bell Laboratory scientists found that the filament surface was covered with little "active" areas which erupted and migrated over the surface of the pockets of thorium.

Two Trillion Atoms

From measurements of the currents in their equipment they estimate that about 50 billion thorium atoms are involved in such eruptions. Each little pocket of thorium, they estimate from calculations, contains from ten billion to two trillion thorium atoms.

The studies were made to determine, if possible, the process whereby the thorium atoms are distributed over the tungsten surface of the filament. This knowledge is basic in the field of filament emission in radio and other vacuum tubes.

Sound Creates Light

Intense audible sounds have been found to produce visible light in fourteen different liquids in the spots where cavitation occurs, said Dr. L. A. Chambers of the University of Pennsylvania Medical School.

Cavitation is the phenomenon occurring in water, for example, at the blades of swift-moving ship's propellers. Holes or empty spaces are created in tiny spots within the fluid. These evacuated spaces collapse suddenly and the liquid comes together with an impact which causes a high, momentary increase in pressure. The resulting effect in the case of propellers is a pitting and erosion of the metal surfaces. Steam turbine blades face the same difficulty.

Dr. Chambers creates the cavitation holes in his experimental liquids by the intense audible sounds with frequency ranging from 1,000 to 9,000 cycles per second.

In the regions where the cavitation was occurring he found that visible light is emitted by the liquid. An adequate explanation is still lacking but it seems probable that the atoms of the fluid are sufficiently excited in the process to emit light.

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