

PHYSICS

Super Atom Smasher

Apparatus in planning stage will hurl atom hearts at each other at energies 200 times the highest now available. Name proposed is "synchroclash."

► A SUPER ATOM SMASHER to hurl hearts of hydrogen atoms at each other with energies nearly 200 times the highest now available is in the planning stage.

Bigger and more powerful machines to speed up the elementary particles of which atoms are made were a top topic at informal sessions among scientists attending a nuclear physics conference at the University of Rochester in Rochester, N. Y.

Suggested name for the proposed accelerator is the "synchroclash." It would actually be two machines whose atomic bullets smack head on into each other, instead of the single beam crashing into a stationary target of present machines. This could give protons energies of 1,000 billion electron volts or more.

Plans for such a super atom smasher are being studied by Midwestern Universities Research Association, composed of 20 universities.

Particle accelerators now under construction or planned have about reached the upper size limit, and scientists are being forced to use "tricks" to reach higher energies.

One trick is to use a very complicated

magnetic field, known as alternate gradient, for focusing speeding particles. The higher the energy, the closer a particle is to the speed of light, limiting velocity according to Einstein's theory of relativity.

The three Russians attending the Sixth Annual Conference on High Energy Nuclear Physics revealed Soviet plans for building an accelerator to reach 50 billion electron volts, or 50 BEV, using this principle.

CERN, a joint enterprise of 12 European nations, and Brookhaven National Laboratory on Long Island are now building atom smashers that will operate at 25 billion electron volts, also using the alternate gradient idea.

The newest trick is to smash one bunch of high velocity particles into another group of speeding atomic fragments, as in the synchroclash. And if two atom smashers, each accelerating protons to 15 billion electron volts were built and a bunch of hydrogen hearts from one were aimed at the other, the resulting collisions would equal 1,000 billion volts in energy. An accelerator operating now reaches the highest energy in the University of California bevatron with a top energy of six billion electron

volts. The first authentic example of anti-matter, the anti-proton, was discovered in this machine last fall.

Russian scientists expect to have a 10 billion volt machine operating within a year.

Scientists build atom smashers with higher and higher energies to create and study new particles, as well as to examine in more detail those already known to science.

Cosmic rays, atomic radiation continually smashing into the earth's outer atmosphere, result from the most powerful accelerator known — but whether from the sun, from other stars, from our Milky Way galaxy or from the universe itself is still to be determined.

Man-made machines are now beginning to duplicate the lowest part of cosmic rays' energy range.

Other particles of anti-matter will probably be discovered as the new U. S. and Russian accelerators now being built start operation.

Science News Letter, April 14, 1956

PUBLIC HEALTH

Clear Washington of Alcoholic Reputation

► THE NATION'S capital is cleared of any alcoholic reputation it has had by a study by Mark Keller and Vera Efron of the Yale University Center of Alcohol Studies.

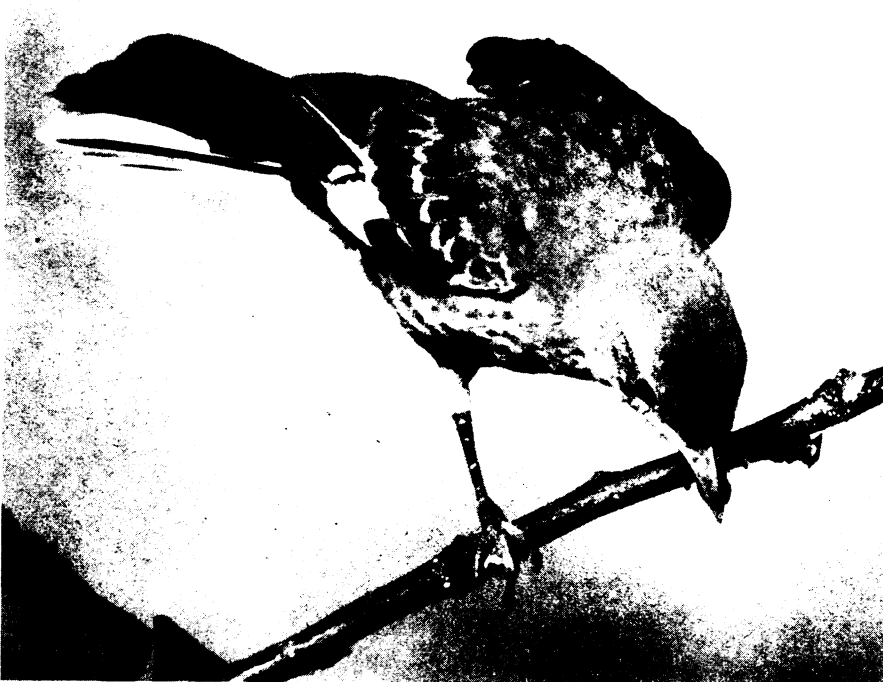
San Francisco had the highest alcoholism rate of all U. S. cities for the year studied, 1950. Its rate was 16,760 alcoholics per 100,000 population over age 20. By contrast, Washington and the District of Columbia which are coextensive had less than half that rate, 7,040 per 100,000 population over age 20. This is about the same as the rates for Chicago, Philadelphia and Pittsburgh and very little more than the approximately 6,000 per 100,000 rates for the much smaller cities of Pasadena, Calif., Utica, N. Y., and Little Rock, Ark.

Lowest alcoholism rate for the nation's 12 largest cities was Baltimore's of 5,120. New York had a rate of 6,200.

Whatever there is about city life that goes with alcoholism, it does not seem to be population density, the scientists point out in their report to the Quarterly Journal of Studies on Alcohol. For example, cities with between 100,000 and 200,000 population such as Wilmington, Del., or Sacramento, Calif., show much higher rates of alcoholism than a metropolis of millions, such as Chicago or New York.

Some states with many large cities, such as Massachusetts and Pennsylvania, have a number of large cities with alcoholism rates that are not much different from or even smaller than the rates of the less urban parts of the states. Big city rates in general, however, tend to have a higher rate than do the less urban parts of the states in which they are located.

Akron, Ohio, where Alcoholics Anonymous was founded, has a rate very little



MOVING NORTH—The mockingbird, whose song once charmed only the Southland, has been gradually spreading out toward the north. It is now reported as far north as Maine, Quebec and Newfoundland.

above the less urban parts of Ohio and well below most of the other large cities in the state.

Cities with the lowest rates in 1940 generally showed increases in 1950 far greater than cities with the highest rates in 1940. This is believed mainly due to improved

reporting of basic medical information.

The rates in the 12 largest cities of the nation were on the average almost twice the rates of the 12 smallest big cities, that is, cities with populations of 100,000 or more.

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POLICE SCIENCE

How Typing Is Disguised

French police scientist warns American colleagues of methods by which criminals alter typing or file down letters on machine to avoid detection.

► POLICE in this country are warned of two methods by which criminals disguise typing or typewriters to avoid detection as the source of threatening letters and other criminal documents.

The warning is published in Chicago in the *Journal of Criminal Law, Criminology and Police Science* (April). It is contributed by Jean Gayet of the staff of the Police Laboratory in Lyon, France.

The first method is very simple. The criminal (whom M. Gayet calls the "male-factor") uses two sheets of paper and one carbon sheet. Between the top sheet and the carbon, he puts a piece of coarse cloth. Then it is the carbon copy that is sent to the victim.

The writing on this copy has a canvas-like appearance which may appear to the police expert as the work of a multigraph or some other duplicator rather than a typewriter. To identify it as carbon, the expert should use a magnifying glass, M. Gayet suggests. If the writing was disguised by use of a cloth, the expert will see a multitude of little colored dots close around each letter.

Do not try to measure the exact height of the letters. This is difficult enough if the typing was done through a fine ribbon.

When done through a coarse cloth, it is completely deceptive. It is possible, however, to determine whether the letter was written with elite or pica type.

It is also hopeless to try to recognize the breaks or recesses in the metal due to use. It is possible to note defects in alignment of letters, whether a particular letter prints too high or too low or too much to the right or the left.

The other method of disguise is done after the criminal letter has been written. The criminal files the keys on his machine so that samples of typing from it will not match the typing in the criminal letter.

Remedy is to examine the machine itself. Notice whether the alterations affect little-used symbols such as %, &, or / as much as such letters as e, i, or o.

If it is not possible to seize the suspected typewriter for examination, get samples of typing some time before the crime as well as since. If the recently made impressions show signs of "wear" that would not be expected in such a short time, that in itself is a good sign that the typewriter has been tampered with and is evidence of guilt.

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in determining the success of industries engaged in highly complex and new products.

Dr. Ramo reported to the Society that the challenging nature of these complex scientific and technological systems, as illustrated by guided missile developments, has already meant a meshing of all the sciences. The widespread teaming of physicists with engineers, and of carefully controlled experiments and unusually deep theoretical analyses, applies over the whole spectrum of new technological developments.

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AERONAUTICS

Missiles to Carry Freight

► GUIDED MISSILES may be carrying a portion of the nation's air freight by 1966, Dr. Simon Ramo, executive vice-president of the Ramo-Wooldridge Corporation, Los Angeles, told the American Rocket Society meeting in Princeton, N. J.

In making his prediction, Dr. Ramo said that even the transportation of passengers will be under precise guidance or automatic control from take-off to landing, even though a pilot will still be present.

Dr. Ramo used guided missiles as an illustration of how complex systems engineering is changing the role of the scientist, as well as the nation's entire industrial make-up.

Guided missile developments of today, he stated, are merely the forerunner of a

vast automating of industry, business and transportation. The development of "synthetic" intelligence devices, such as electronic "brains," will have the most major of consequences, peace or war, Dr. Ramo told the Society.

A stumbling block to the march of progress in these directions, Dr. Ramo cautioned, will be the shortage of technically skilled personnel.

Both educational methods and the training of scientists and engineers brought about by complex systems engineering will be changed, he predicted.

The coming decades will be distinguished in industry by the growth of the technical manager, and technical considerations will dominate over more conventional factors