



COMET DISCOVERER—*Michiel J. Bester of Harvard's South African station last year discovered three comets out of a total of only nine new ones found.*

During the second week of April it will be getting closer to the North Star. Comet Bester will pass across the constellations of Draco; Ursa Minor, the smaller bear; Draco again and into Ursa Major, the larger bear.

On April 13 the comet will be directly north of the "head of Draco." On April 21 it will pass between the Guardians of the Pole Star, Beta and Gamma Ursa Minoris. By this time, however, the comet will probably have faded so much that it will no longer interest amateur astronomers. But it should still show up well even then when seen through a telescope.

Science News Letter, February 21, 1948

INVENTION

Blade Kills Weeds by Cutting Underground Roots

➤ AN implement that kills weeds as cutworms kill your favorite garden plants, by clipping off their roots below the ground surface, is the invention on which Charles S. Noble of Nobleford, Alberta, has received U. S. patent 2,432,035. Mr. Noble is already well known for his system of sub-surface cultivation, which stirs the soil with minimum disturbance of surface-protecting vegetation or litter. In the present invention, a gently arced blade is drawn along a couple of inches under the surface, clipping off weed roots as it goes. The surface layer rides over the arc and drops back into place.

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MEDICINE

Experiments on Prisoners

Reduction in sentence should not be so great as to influence volunteering. This advice is given by a committee of medical and religious leaders.

➤ THE Soviet scientist who is reported as saying American medical scientists follow Nazi methods when they use prisoners in medical experiments can find how wrong he is by reading a report in the *Journal of the American Medical Association*, (Feb. 14).

Even when prisoners are given a reduction of sentence in prison as a reward for volunteering their services, the reduction in sentence should not be so great that it could influence them to volunteer for medical experiments. To make sure that it has no influence, the amount the sentence is reduced should be decided in relation to each prisoner and the nature of the experiment.

This, in brief, is the advice given the Illinois Department of Public Safety by a committee of medical, religious and lay leaders appointed by Governor Dwight H. Green of Illinois.

"The most important requirement for the ethical use of human beings as subjects in medical experiments is that they be volunteers," the committee states.

"Volunteering exists when a person is able to say 'yes' or 'no' without fear of being punished or of being deprived of privileges due him in the ordinary course of events."

An excessive reduction of sentence would be "inconsistent with the principle of voluntary participation," the committee explains, because it might exercise undue influence in gaining the consent of the prisoners to serve as subjects if their sole motive for doing so is to gain a reduction in sentence.

Prisoners are not the only persons who have volunteered for experiments planned to advance human welfare. Medical scientists, medical students, soldiers, sailors and others have also volunteered. These experiments have always been carried out according to certain ethical principles and rules.

One such rule is that if there is any reason to suspect that death or disabling injury may occur, as in experiments such as those of Walter Reed which showed the mosquito spread yellow fever, "then medical scientists should serve or should have served as volun-

teers along with nonscientific personnel," the committee states.

Consent of the volunteer must be obtained, without coercion, and he must have been informed of the dangers, if any.

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GEOLOGY

Home-Made Seismograph Detects Quake in Alaska

➤ AN earthquake that shook Fairbanks, Alaska, recorded itself on a seismograph built by a high school senior, Michael D. Lubin, 17, of Tottenville High School on Staten Island, N. Y. Although of simple construction, the instrument operates on the same principles as the elaborate mechanisms used by professional seismologists.

The seismograph he has constructed is of the type known as the Bosch-Omori, from its original inventors. Its foundation consists of a heavy block of concrete sunk in the earth, with a vertical pillar rising from it. Projecting horizontally from this, near its base, is a hinged horizontal arm or boom, which carries a heavy weight. An oblique wire or rod to the top of the pillar helps support the weight, which is free to swing as a horizontal pendulum.

A long but light continuation of the boom carries a writing point at its end. This rests lightly on smoked paper stretched over a horizontal cylinder or drum, which is slowly turned by clockwork. This is the recording mechanism.

When the waves from a distant earthquake, undetectable by ordinary human senses, reach the instrument they cause the vertical pillar to sway by a microscopic amount. The inertia of the heavy pendulum mass tends to hold it motionless against the swing of the boom. This in turn produces an exaggerated amount of apparent motion at the recording end, which registers itself as the familiar wiggly line of a seismogram.

Mr. Lubin states that his instrument is not as sensitive as he would like, because it had to be set in the clay subsoil of Staten Island, 50 feet above the nearest bedrock. Loose material like clay does not transmit waves so well as solid rock,

such as forms the foundation of professional observatories like that at Fordham University. Nevertheless, this instrument has in the short term of its operation recorded one major earthquake 3,300 miles away, in Fairbanks, Alaska, and a

number of other shocks at lesser distances.

Mr. Lubin is a winner in the Seventh Annual Science Talent Search, and will be in Washington from Feb. 27 through March 2, at the Science Talent Institute.

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GENERAL SCIENCE

Scientists in Legal Mixup

Criminal prosecution endangers America's greatest scientists for their roles in contributing to the winning of World War II.

➤ HUNDREDS of America's greatest scientists "stand in theoretical danger of prosecution under the criminal statutes because of their contributions to the winning of a war," a former official of the wartime Office of Scientific Research and Development charged.

This ironic situation involves legal technicalities and some obscure legislation which Congress did not get around to passing. The scientists include Dr. Vannevar Bush, president of the Carnegie Institution of Washington and former director of OSRD, Pres. James B. Conant of Harvard and countless other leaders in science and education.

These men, who organized the scientific effort which produced radar, the proximity fuze and many other important developments which played important roles in winning World War II, served on OSRD and other groups without getting a salary. This made it possible for these men to continue in their positions as leaders of non-government organizations. Many of them might not have been able to serve as important planners and advisers to victory if they had been required to resign their peacetime jobs.

But this also has left them in a position of having violated the law, Pres. Irvin Stewart of West Virginia University, disclosed in a new book, "Organizing Scientific Research for War" (Little, Brown and Company, Boston, 358 pp., \$5.00).

The legal difficulty comes from the fact that OSRD and some of its committees entered into contracts with several of the nation's best-known scientific institutions while leading officials of the institutions were serving with OSRD. Examples cited by Dr. Stewart include Harvard University, Massachusetts Institute of Technology, California Institute of Technology, Columbia University, University of Illinois, University of

Pennsylvania, Johns Hopkins University and Bell Telephone Laboratories.

Dr. Stewart, who served as deputy director of OSRD under Dr. Bush, points out that the wartime organization did not permit members to participate in consideration of contracts with their own organizations. But the legal dilemma was never formally solved.

In 1941, Dr. Bush received an opinion that his own position was not in violation of the law. Then, in 1943, a ruling on local OPA boards apparently made the scientists liable under sections 109 and 113 of the Criminal Code. In both the Seventy-seventh and Seventy-eighth

Congress legislation to make the scientists exempt from these sections of the code failed to pass.

Under the Criminal Code, violators of section 109 "shall be fined not more than \$5,000 or imprisoned not more than one year, or both. . . ." Maximum penalties under section 113 are a fine of \$10,000 and not more than two years' imprisonment.

Dr. Stewart believes that, as things stand, many famous scientists have violated these sections.

"Fortunately, it does not seem at all likely that any of them will ever be prosecuted for those technical violations, for in practice the OSRD avoided situations involving actual conflicts of interest," he explains, "but there is no denying the theoretical possibility is there."

The legal tangle is only one of several technical difficulties, outside the laboratory, which OSRD faced in organizing American scientists for World War II. Manpower, supplies, security and publicity were all a part of the administrative headaches which plagued science leaders as well as military officials in the war. And Dr. Stewart's report on administering science indicates that even leading scientists were not able to develop a completely satisfactory "redtape-snipper."

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HALF-TON MOVER—Claimed to do work of four men with wheelbarrows, this machine has a capacity of 1000 pounds of wet or dry materials and the ability to climb a 20 per cent grade with a full load. It has a three horsepower air-cooled engine and operates for eight hours on three gallons of fuel. It can be equipped with a bucket or a sturdy steel and wood platform deck and there is even a snow plow attachment available.