

CHEMISTRY

Rediscover "Lost" Secret Of Stradivarius Varnish

► THE "lost" secret of the varnish used on Stradivarius, Guarnerius and other famous old Italian violins has been rediscovered and the varnish duplicated by Joseph Michelman of Cincinnati. Chemical and spectrographic analyses of small samples of varnish removed from authentic old violins show many things about its composition.

Recently Mr. Michelman, with the technical assistance of Otto Lang and Everett J. Shaw, has analyzed the red-brown varnish of a Francesco Ruggieri 'cello, made in 1691; he reports briefly on his results in *Science* (June 25).

The 'cello was double-coated, with a yellow under-varnish and a brown-red top coat. The red color was found to be due to madder, a vegetable dye. Spectrographic analysis showed the presence of considerable calcium, with smaller amounts of other metallic elements.

It was known that the type of varnish known as calcium rosinate is brown. When varnish of this kind was mixed with raw linseed oil and applied, the color was lost. However, when the oil was pretreated and the varnish then applied in thin coats and exposed at once to light, the color became permanent.

Mr. Michelman states in conclusion, "A brown-red varnish composed of alizarine-calcium rosinate and linseed oil, with turpentine as the solvent, has been prepared that possesses the desired depth of color, transparency and permanence in its dried and aged films."

Science News Letter, July 10, 1948

GENERAL SCIENCE

Better Fitting Clothes Part of Standards Study

► HOW MANY feet of concrete are needed to protect you from extremely high voltage X-rays and how to make children's clothes fit more children better are two problems now being solved by research at the National Bureau of Standards.

Dr. Edward U. Condon, director of the Bureau, described the new studies as guest of Watson Davis, director of Science Service on Adventures in Science, heard over the Columbia network.

A new 50-million volt betatron at the Bureau will be used to set standards for safety from the high voltage rays. Dr. Condon explained that safety standards are required by the use of high voltages in industrial applications of X-rays.

Mothers may have better luck fitting their youngsters with new clothes, thanks to research being conducted at the Bureau in cooperation with the Bureau of Home Economics of the Department of Agriculture which supplied measurements of more

than 100,000 children. The figures have shown what most parents have discovered that age is a poor guide to fitting their children with clothes.

When new, voluntary standards are adopted by industry, better fitting clothes can be expected by parents. Next clothing standards job will be a sizing system for teen-agers.

Other Bureau research reported by Dr. Condon included a standard of length 21-millionths of an inch long and calculating machines which work at nearly the speed of light.

A single wavelength of green light radiated by an atom of mercury with an atomic weight of 198 is being used as a measuring standard. This variety, or isotope, of mercury is produced in atomic piles by bombarding gold with neutrons. For measuring, this light gives scientists an indestructible standard, because all atoms of this form of mercury will always give the same wavelength of light.

With mathematics and statistics forming an important part of fundamental research in modern science, a National Applied Mathematics Laboratory has been established at the Bureau to speed the solving of mathematical problems. New computing machines, Dr. Condon pointed out, will work at speeds measured in millionths of seconds.

Science News Letter, July 10, 1948

ARCHAEOLOGY

Ancient Indian "Whodunit" Posed by Skeletons

► THE old but not very elegant lyric that demands to know "Who put the overalls in Mrs. Murphy's chowder?" has a newer counterpart about a still older and grimmer mystery: Who jammed dead Indians in the Delaware clambake pits?

The Smithsonian Institution has just come into possession of several skeletons found in some four-foot-deep pits near Lewes, Del., filled with oyster and clam shells. They were not regular burials, but the distorted positions of the skeletons indicated that the dead men had been forced into holes too small for them.

Dutch settlements came early to this part of the Delaware coast, yet there is no trace of white men's trade-goods with any of the skeletons. The finds are therefore presumably pre-Columbian.

The pits were discovered in the course of plowing some long-uncultivated land. First thing noticed was the unusually large size of the clam and oyster shells, although they belong to the species still found in the region.

Attention of the Smithsonian to the finds was called by the Sussex County Archaeological Association, which turned over all the material. The site has been examined by Dr. T. D. Stewart, Smithsonian curator of physical anthropology.

Science News Letter, July 10, 1948



METEOROLOGY

Daily U. S. Weather Map Gets That "New Look"

► THE U. S. Weather Bureau's daily weather map has a real "New Look." Three new things have been added:

1. The top line of the main map has been pushed considerably to the north, up to latitude 55 degrees. This will include such Canadian cities as Edmonton and Saskatoon, and the great sweeping spaces of the Prairie Provinces over which so much of our weather comes to us, especially in winter.

2. The small inset map showing the weather of the previous day has been enlarged to show conditions for the entire North American continent, and a considerable stretch of ocean on either side.

3. An entirely new inset map will show, as continuous lines, the altitudes at which an atmospheric pressure of 700 millibars exists. This is normal pressure for 10,000 feet altitude, but the height at which it can be found at any given moment varies, which makes it a matter of considerable importance not only for airmen but for many people on the ground whose business is affected by the weather. The same map will show temperatures, at intervals of 10 degrees Fahrenheit, on the 700-millibar "contours," and also existing weather fronts at the same level.

Science News Letter, July 10, 1948

SEISMOLOGY

Four Separate Quakes Recorded in Three Days

► FOUR separate earthquakes in three days were recorded in the last days of June.

The quakes began Sunday, June 27, with shocks south of the Alaska peninsula and under the Gulf of Mexico off the Guatemalan coast. A disastrous shock struck Japan June 28 and the region of the Samoan Islands was shaken the following day.

Scientists say that there is no evidence that such widely separated quakes are related in any way.

Although thousands of persons were killed and injured in the destructive Japanese quake, the one in Samoa was rated as just as strong a shock. The difference was that the former rocked a thickly populated area. Both were rated 7.25 on the seismologists' scale of magnitude.

Epicenter of the Jap quake was not on land, as had at first been suggested, but under Wakasa Bay, some 35 miles west of the ruined city of Fukui.

Science News Letter, July 10, 1948

CE FIELDS

CHEMISTRY

Fuels from Nitrogen Find Many Industrial Uses

► NITROGEN from the air, which makes up four-fifths of what we take into our lungs at every breath, is a raw material from which fuels to supplement petroleum products will be made, particularly for special uses.

Certain nitrogen compounds, including ammonia and hydrazine, are actively being considered as fuels, the American Chemical Society was told at its meeting in Syracuse, N. Y., by L. F. Audrieth of the University of Illinois. The Germans, he said, experimented successfully with hydrazine to power submarines during the war. Concentrated ammonia, not the weak household solution, is already being used as fuel.

Nitrogen is one of the few inexhaustible raw materials since it is the major ingredient of the earth's atmosphere. This nitrogen is now being converted into useful chemicals by several processes. The most important of these is one by which the nitrogen is combined with hydrogen to form ammonia. From this ammonia many other nitrogen compounds can be made.

Among the newest of the basic nitrogen chemicals are hydrazine and hydroxylamine, both of which were largely laboratory curiosities ten years ago. Today, both are being produced in substantial quantities and new industrial uses are being found for them.

Hydrazine is a watery liquid which makes an excellent fuel because it burns with a hot flame and gives off no toxic gases. A chemist might call it a nitrogen analogue of the hydrogen peroxide long used for bleaching and other purposes. It is similar in chemical make-up but contains nitrogen instead of oxygen. Hydroxylamine stands between hydrogen peroxide and hydrazine, containing both nitrogen and oxygen.

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ASTRONOMY

Red Stars Grow Fat on Falling Dust Particles

► SMALL, red stars embedded in a dust cloud are growing fat on dust particles falling into them from the cloud, Dr. Otto Struve and Dr. Mogens Rudkjøbing of Yerkes and McDonald Observatories of the Universities of Chicago and Texas have discovered.

Very luminous blue and white stars in the dark nebula repel the dust by the outward pressure of their strong light, so that the particles cannot fall into their atmo-

spheres. But the small, relatively cool stars are bombarded by the bits of interstellar dust.

The dust particles seem to supply just the right amount of energy to give the spectra of these stars a number of peculiar bright lines. Dr. Struve characterized as "premature," however, any conclusion that all stars with these peculiar emission-lines are actually being born. He spoke at the joint meeting of the American Astronomical Society and the Astronomical Society of the Pacific at Pasadena, Calif.

Two years ago astronomers were thrilled by the announcement from Mount Wilson Observatory that Dr. A. H. Joy had observed some 40 stars with strong emission lines in their spectra. These stars were located in the vicinity of the great dust clouds in the constellation of Taurus, the bull. Dr. Joy suggested that the bright radiations of hydrogen, calcium and other gases might be connected with the presence of diffuse matter in the vicinity of these stars.

In extending this study, the McDonald astronomers obtained spectra of stars in the enormous opaque mass of cosmic dust located in the constellations of Ophiuchus, the serpent holder, and Scorpius, the scorpion, about half way between the bright stars Rho Ophiuchi and Sigma Scorpii. Stars in this region are mostly faint, and there are few of them. The dark cloud, about two million billion miles away, practically obliterates the light of the stars behind it.

The bright blue-white stars in the cloud were found to have no abnormalities in their spectra, indicating that they were not influenced by the nebosity. Among the faint stars, a nest of them were found to have peculiar emission lines. Six such stars are close together, located in one of the densest regions of the dark cloud. One of these stars also varies in brightness, indicating that it is definitely associated with the dust cloud.

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INVENTION

"Preference Recorder" Registers Your Opinion

► HOW WOULD you like to be able to let the management know that its show is good, swell, punk, lousy, just by turning a button? A device to do just that has been invented, and U. S. patent 2,444,327 has been issued on it, to Alan W. Baldwin of New York.

It is a compact little box, with a dial and a hand-operated indicator that can be moved from neutral to plus one and plus two to indicate degrees of approval, or to minus one and minus two to register distaste. Inside, an electric mechanism writes a stepwise graph on a moving tape. This can be taken out and sent for analysis to radio or television headquarters—or even to the worried managers of a political convention.

Science News Letter, July 10, 1948

RADIO

Doctors Out Making Calls Are Paged by Radio

► PAGING doctors away from their offices will be the job of a special radio station to be erected in New York. Telanserphone, Inc., has now been granted a construction permit by the Federal Communications Commission to test the feasibility of the plan.

The station will provide only one-way transmission. It will serve the immediate New York area. Each doctor enrolled for the service will carry a small portable receiver. Each will be assigned an individual code number. This will be repeated on the air at intervals until the doctor reports to the station by telephone.

The theory behind the plan is that by it any individual doctor when out making calls may be located more easily than by the present procedure in which he is located by telephone, where frequently many calls must be made.

Science News Letter, July 10, 1948

ARCHAEOLOGY

Sinai Peninsula Inhabited Since Neandertal Times

► THE Sinai peninsula, through which the Children of Israel passed during their long wanderings in search of the Promised Land, served as a land bridge between Africa and Asia long before their time, new evidence discloses. Wendell Phillips, leader of the University of California African Expedition, tells in *Science* (June 25) of recent discoveries of stone implements showing that the region has been inhabited successively by Neandertal and Cro-Magnon men of the Old Stone Age, tribes of Neolithic or New Stone Age date, and a people of the transition period between the Neolithic and the beginning of the Age of Metals.

Egyptians were in Sinai from the earliest development of their civilization in the valley of the Nile, the expedition's archaeologists found. The great attraction for them was the turquoise mines of the region, which were worked by slave labor under Egyptian overseers.

Beginnings of the Semitic alphabet, which eventually developed into the beautiful characters of Hebrew script, date from these turquoise-mining days. Most of the letterings found on the rocks are fragments of tomb inscriptions, commemorating captive Semitic tribesmen who died under the harsh working conditions of the mines.

The expedition has also worked in Egypt, especially in the desert west of the Nile. Fossil remains of primitive whales and other aquatic animals found there show that this part of Africa was sea bottom in the pre-human millenia of the earlier Age of Mammals. Here also were found stone implements indicating long human occupation through the Old and New Stone ages.

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