SCIENCE NEWS

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GOLD DISCOVERED IN THE SUN

DR. CHARLOTTE E. MOORE, of Princeton University Observatory, and Dr. Arthur S. King, of Mt. Wilson Astrophysical Laboratory, reported at a meeting of the Astronomical Society of the Pacific that evidence of gold in the sun has been obtained for the first time. The discovery of gold makes a total of 66 elements positively or tentatively identified in the sun out of the 90 found so far upon the earth. The evidence depends chiefly upon the fact that one of the strongest radiations or spectrum lines emitted by gold in the form of a glowing vapor agrees closely in position with a weak unidentified line in the spectrum of the sun.

It was already known that gold is so scarce in the sun that only the strongest lines observed in the laboratory would be likely to appear as very weak lines in the solar spectrum. Unfortunately, the strongest gold line of all —its so-called ultimate line—is hidden from view in the solar spectrum by the powerful ozone absorption bands of the earth's upper atmosphere. So little was known about the remaining strong lines of gold that occur in the observable parts of the solar spectrum that it was useless to attempt their identification.

The situation until two years ago was somewhat similar to that of a miner who has a map showing the location of several dozen veins of gold within a huge mountain side, all of which are very thin with one exception. He would like to bore for this single rich vein, but he does not know which one it is.

However, when the results of an investigation of the sensitiveness of lines in the gold spectrum became available in 1941, the search for gold in the observable region of the sun's spectrum could proceed with more certainty. It would be highly appropriate if the critical line upon which the identification depends occurred in the yellow-orange part of the spectrum. Actually it is in the ultraviolet, invisible to the eye but readily observable by photography.

One possible source of error remained that might invalidate the entire proceedings. The position of the solar line was obtained from a catalogue of the solar spectrum compiled over half a century ago by the famous physicist, H. A. Rowland, of the Johns Hopkins University. Some of the weakest lines listed by Rowland do not appear on modern plates, although the same plates may show other weak lines not observed by him. This is particularly true near the ultraviolet limit of the solar spectrum. In addition, this line of gold is what is known as a "low temperature line" or one that is strong in comparatively low temperature sources of light. Therefore, it should appear stronger in sunspots, where the temperature is about 8,000 degrees Fahrenheit, than in the surrounding surface of the sun at a temperature of 11,000 degrees Fahrenheit.

To check on these points, Harold D. Babcock and Mrs. Mary F. Coffeen, of the Mt. Wilson Observatory, made an examination of photographs of the sunspot spectrum taken during the course of a previous investigation. Not only did they find a weak solar line at the proper position but it was also seen to be moderately strengthened in the spot as would be expected of a low temperature line. They concluded that, "This moderate strengthening in the spot together with the satisfactory correspondence in position of the solar and laboratory lines, would seem to justify the statement that gold is now identified in the sun."—ROBERT S. RICHARDSON.

THE SCARCITY OF SCIENTIFIC APPARATUS

SCIENTIFIC laboratory apparatus is on the list of scarce articles; that is, unless the laboratory needing the apparatus is doing war work. Equipment for physics will be particularly short because the 240,000 servicemen now being sent to 450 colleges and universities will all be required to take courses in physics.

The Army and Navy need hundreds of thousands of physicists and men with a knowledge of the fundamentals of physics. War is technical. Fighting, transportation and communication articles of equipment are all technical also. Most of them are based on the principles of physics. They were developed and constructed by physicists and engineers. In the military service they are used by servicemen, and they must be kept in repair by servicemen.

The institutions where these servicemen are now being trained will need large quantities of new apparatus. Much of their old equipment does not fit into the exact courses the armed services require. They will need also instruments of the exact types the services are using so that the trainees will be familiar with the appliances they will use in the field.

The scientific instrument manufacturers will meet the needs as far as possible. Their capacities to produce the required apparatus at this time are somewhat limited. Long ago many of them converted part or even all of their facilities to war work, constructing physical apparatus needed in the war industries and in the armed services. They will be able to produce what is needed in the college training courses for men in the service, but probably very little if any for civilian laboratories not in war work.

Restrictions placed on the purchase of laboratory apparatus nearly a year ago by the War Production Board to save critical material and permit the factories to concentrate on war needs, have now been amended. Laboratory apparatus for the college military training programs now falls into the category of purchase orders for which applications must be made to the War Production Board, irrespective of the value of the items desired. This procedure is intended to control the distribution of the available equipment so that the war needs will be served first.

The needs of pre-induction courses in high schools will probably not be overlooked. These courses for young men who will reach induction age soon are given by the schools at the request of the Army.

Laboratories working on radio programs for the Army or Navy hereafter will be able to get from a central agency the supply of critical electronic components not quickly available in commercial channels. This agency is

the Electronic Research Supply Agency, formed under the Defense Supplies Corporation at the request of the armed services, the Office of Scientific Research and Development and the War Production Board.

Active operation of the Electronic Research Supply Agency will begin about May 1 under an executive committee representing the government divisions concerned. Its office and stockroom will be located in New York City. As a central source of electronic parts, it expects to save laboratories the necessity of building up their own complete stockpiles of components. Laboratories, however, will not be compelled to use this central agency. It is merely for their convenience.

FIRST AID TREATMENT OF SHOCK IN SEVERE BURNS

A DRINK of salt water, of just the right strength, may become the future first aid treatment for shock in extensive burns.

Experiments at the National Institute of Health by Dr. Sanford M. Rosenthal, principal pharmacologist of the U. S. Public Health Service, point that way, although so far no human trials of the method have been made.

Survival rate for the first two days among burned mice given about one fourth of a teaspoon of the salt drink was about twice as high as among the animals not given this drink. When the animals were given two salt drinks, one and four hours after the burn, only about 13 out of 100 died the first day and 17 out of 100 on the second, as compared with about 93 out of 100 dying among untreated controls.

Dr. Rosenthal compared the salt drink treatment for shock from burns with other standard methods of treating shock. No benefit was observed, he reports, from epinephrine (adrenalin), posterior pituitary gland extract, adrenal cortical extract or a synthetic adrenal cortical hormone preparation. Human blood serum showed little effect when injected into the veins of the mice. Mouse blood serum was more effective but not as good as the salt drink.

Whether a salt drink can replace blood serum or blood plasma as life-saving treatment for shock in human victims of burns can not be told until more experiments have been made. The salt drink treatment is based on a different principle from that of replacing lost fluids as by plasma or blood transfusions. In mice, Dr. Rosenthal finds that death, occurring within a day or two after an extensive burn, is closely related to a disturbance of the balance of sodium and potassium in the body as well as to the escape of fluids from the blood stream. The upset in sodium potassium balance seems the most important, and may be the cause of the concentration of the blood and other effects attributed to the loss of fluids in the burned areas. Doses of potassium speeded death in the burned mice, and when this was given with sodium chloride, it antagonized the effects of the salt drink. The strength of the salt drink has to be such as not to upset the fluid balance of the body, and should have about the same osmotic pressure as that of the blood.

Since it is the sodium of the salt that is effective, other sodium salts, such as sodium bicarbonate, might be given if the salt drink proved too nauseating. Salt tablets of the right dose with a glass of water might prove the most practical method for first aid use, if the new treatment develops into one useful for human burn victims.

Further studies on methods of saving those who succumb to burns after the first two days will be made. The studies have so far been limited to effects of treatment for shock, rather than for the burn itself, since in man from 60 to 80 per cent. of the deaths from extensive burns occur within the first few days as the result of shock.—JANE STAFFORD.

ITEMS

HARVARD'S professor emeritus of Arabic, Dr. James R. Jewett, who died on March 31, at the age of 82 years, played a leading part in Harvard astronomy. The most modern Harvard telescope, although not the largest, the 24–33 inch Schmidt-type instrument, was provided by Professor Jewett. This telescope inspired a similar Schmidt telescope installed with Harvard cooperation during the past year at the new Mexican National Astrophysical Observatory at Tonanzintla. An enthusiastic amateur astronomer, Professor Jewett gave Harvard Observatory his own 9-inch refracting telescope, made by Clark, and he enjoyed seeing it used for instruction and entertainment of visitors on the Observatory's open nights. His last gift will make possible the Annie J. Cannon memorial volume which will contain the work of that Harvard woman astronomer which was unpublished at the time of her death two years ago.

DR. ERNST F. W. ALEXANDERSON, consulting engineer of the General Electric Company, predicted in a science forum address at Schenectady that air traffic of the future will be guided by chains of ultra-short-wave radio beacons, as air traffic of past years was guided by chains of light beacons. They will cross the continent like highways, enabling the aviator to fly above the clouds and yet see his way in three dimensions by radio vision, as unmistakably as if he were looking at rows of street lights on a clear night. An adaptation of the system will guide ships at sea, however thick the fog, so that collisions will have no more terrors for navigators. A revival and perfection of the radio-echo sounding device, tried some years ago on airplanes, was another prediction of Dr. Alexanderson. This instrument was designed to tell the aviator not merely his altitude above sea level but his height relative to the actual terrain he was crossing; also to warn him if a suddenly rising mountain peak loomed ahead.

DESTRUCTION by ultraviolet light of the virus type of disease germ depends on hitting a certain vital spot or "Achilles heel" of the virus, according to Dr. Harvey C. Rentschler, director of research at the Westinghouse Lamp Division. This statement was based on thousands of tests made with the aid of Miss Galina Mouromseff, staff bacteriologist, in which bacteriophage, a virus that destroys bacteria, was subjected to ultraviolet light barrage. "This ability of ultraviolet to inactivate virus," Dr. Rentschler said, "means that science now has an effective weapon to use in the battle against influenza, infantile paralysis and the common cold among other diseases thought to be caused by virus."