

ASTRONOMY

Gold in the Sun.

Evidence obtained for the first time of presence of gold in the spectrum of the sun brings total of earth elements found on sun up to 66.

► EVIDENCE of gold in the golden sun has been obtained for the first time, Dr. Charlotte E. Moore of Princeton University Observatory and Dr. Arthur S. King of Mt. Wilson Astrophysical Laboratory, have announced to the Astronomical Society of the Pacific. 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 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 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

PHYSICS

Radium Method Difficult

Measuring large quantities of water by means of minute quantities of dissolved radium is not simple. Many sources of error found.

► RADIUM in tiny quantities may be used to measure large masses of water, but the method is not as simple as it seems at first glance, Dr. Victor F. Hess, German Nobel Prizeman in physics now at Fordham University, told the American Geophysical Union at its meeting in Washington, D. C.

Some indirect means is desirable for accurately measuring large quantities of water in reservoirs, where direct weighing is not possible. One method that has been tried has been to dissolve a lot of salt in the water, then collect a sample of it as it comes out of the tailrace of the power plant and determine the salt concentration in that.

Some time ago the noted French physicist, Dr. J. Joly, suggested the use of minute amounts of radium, which diffuse rapidly and evenly in water, but he did not do any experimental work on the method himself. Dr. Hess has done so, making use of a large tank in Pennsylvania, loaned for the purpose by a power company.

Sources of error were found to be more numerous than anticipated. There was a tendency for part of the radium to become tied up in insoluble form with

stronger in sunspots, where the temperature is about 8000 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."

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"hardening" chemicals in the river water; this could be partly overcome by adding hydrochloric acid. Minute but variable amounts of radium are naturally present in the water, so that their effect has to be measured in advance and proper allowances made. Even the type of glassware used in the laboratory may falsify results unless great care is exercised.

Dr. Hess concluded by cautioning his hearers not to "attempt blindly to set out to measure large volumes of water with too little radium."

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Earthquake Waves Clocked

➤ EARTHQUAKE waves can travel along the surface of the earth at more than cannonball speeds, a paper by Ralph R. Bodle of the U. S. Coast and Geodetic Survey disclosed. Just before the war broke out, a special seismograph was installed at St. Georges, Bermuda, to catch crustal waves moving over the bottom of the Atlantic and measure their speed. Velocities of such waves, measured not only at this station but at one in Norway, averaged about 4.5 kilometers (2.79 miles) per second.

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Mississippi's Flow Data

➤ DURING the century from 1839 to 1938, the Ohio river poured approximately 280,000 cubic feet of water into the Mississippi River every second. In the same period the mean flow of the Mississippi, just below the junction of the Red River, was about 635,000 cubic feet per second. These figures were presented by Dr. Clarence S. Jarvis of the U. S. Soil Conservation Service. The data are taken from government records.

"Fortunately for the science of hydrology, and for all to which it relates, the rainfall, temperature, and other climatological data, including daily river stages and daily forecasts, had become entrenched as essential parts of the U. S. Weather Bureau records," Dr. Jarvis stated.

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Recorder for Wind Data

➤ A PHOTOGRAPHIC recorder used to replace previous methods of obtaining a series of wind velocity measurements was described at the meeting by Dr. Leonard B. Corwin of the U. S. Soil Conservation Service.

Dr. Corwin stated that the recorder was developed to secure simultaneous measurements of wind velocity at several different levels where electrical power was unavailable. The dials or faces of several counters were photographed as the simplest and surest way to obtain multiple records. By adjustments, photographic observations could be obtained at intervals of one minute up to an hour or more.

Dr. Corwin stated that the photographic recorder "appears to offer a means of obtaining an autographic record of many if not most meteorologic

and climatic values." Further simplification of the apparatus is contemplated.

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MEDICINE

Fish Oils May Be Source Of Blood Pressure Remedy

➤ COD LIVER OIL and other fish oils may prove to be a source of a high blood pressure remedy, it appears from a report by Dr. Arthur Grollman and Dr. T. R. Harrison, of the Bowman Gray School of Medicine at Wake Forest College, to the Society for Experimental Biology and Medicine. (*Proceedings*, March)

Fish body and liver oils, they discovered, contain a substance which is effective in reducing high blood pressure in rats. The substance is not the same as vitamin A, which is contained in fish liver oils and which some scientists have believed has a blood-pressure reducing effect. It is, however, similar to the kidney extract hailed a few years ago as a potential remedy for high blood pressure.

Both the kidney extract and the fish oil substance can be given by mouth. Both reduce the blood pressure slowly and have a relatively prolonged effect compared to other substances that reduce high blood pressure.

The blood-pressure reducing substance, however, is present in only small amounts in animal kidneys. Fish oils, on the other hand, are relatively potent in reducing blood pressures and are readily available. Therefore, in the opinion of the investigators, they "offer greater promise than kidneys" as a source of a blood pressure remedy.

Further experiments are in progress to learn the nature of the substance in fish oils which reduces high blood pressure in rats.

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Sugar-beet farmers are advised to plant a new variety of *potato* named Pawnee because it matures and can be dug before the beets are ready to harvest.

The U. S. Bureau of Mines has undertaken a greatly expanded search for bauxite, alunite, and aluminous clays to make the country independent of imported bauxite for *aluminum*.

Tight oak or gumwood *barrels* may be used for the transportation of cottonseed and linseed oil, soap, lubricants, and strong alcohol, if coated internally with a solution of sodium silicate.



The Merry Month

➤ EASTER, just past, has a few very ancient, pre-Christian practices lurking behind its orthodox ecclesiastical decorations and observances (See *SNL*, April 24). Many persons praise as wise the traditional policy of the Church, of not attempting to suppress all heathen observances by a converted people, but permitting the retention of those that are innocent or unobjectionable. Thus, relics of the old equinoxial, seed-time festivals survive in Easter customs—rather badly dislocated in time this year because of the unusual lateness of Easter.

The new religion writes a thinner palimpsest-script over the old in May Day celebrations. For one thing, there is no important Church feast-day on May 1, so that observance of the day can be much more frankly secular.

May Day is what even its attenuated modern form indicates, primarily a flower-time feast, as the pagan festival supplanted by Easter was a seed-time celebration. It marks the advance of the year, the growing of hopes for a good harvest of fruit from the blossoming boughs, of grain from the soil that has sent forth bright promises in the form of violets and anemones and buttercups.

Nowadays May Day is almost altogether a children's holiday, except where colleges and girls' schools choose and crown their May Queens. However, this enthronement for a day of the prettiest young woman in the community isn't merely a momentary stretching-out of childhood; it is actually a closer approach to the original form of the old festival. For May (as young people don't need to be told) is a time for romance and love-making, and the Queen of May was the village's living image of the