

motions of various parts of the spiral galaxy, but must determine which edge is nearest the earth. This must be done by studying photographs of the galaxy itself.

Two tests for determining which side of a galaxy is nearer the earth were suggested a number of years ago by Dr. E. P. Hubble of Mount Wilson and Palomar Observatories in California. His observations led him to conclude that the arms are trailing. Dr. Irwin examined 18 galaxies, applying to them Dr. Hubble's two tests and his two new ones. The arms of each trailed behind the twirling center, he found.

Science News Letter, January 5, 1952

INVENTION

American Inventors Earned 44,356 Patents During 1951

► THE U. S. Patent Office found 1951 a busy year, issuing 44,356 patents or 1,284 more than during 1950. The weekly average output was 853, while for 1950 it was 828. The actual number issued each week hovered close to the year's weekly average.

Patents for new chemical compounds and improved processes for making old chemicals stand high in number, again indicating America's leadership in the chemical field. Notable among these chemicals are pharmaceuticals, dyestuffs, insecticides, fertilizers, fungicides, explosives, detergents, fuels, synthetic fibers, weed-killers, water softeners and many others for use in the industries, the household or on the farm.

Metallurgists have received many patents during the year, particularly for new alloys, including some able to better withstand the high temperatures in gas turbine and jet engines, others with increased strength or hardness, and several assured longer life because better able to resist corrosion.

Substitute metals may come into wider use, replacing common metals now in short supply, because of new processes of treatment discovered. For instance, aluminum containing a small amount of boron has the necessary strength to replace copper for electrical wiring. Magnesium containing three of the so-called rare metals has strength and durability and will find many applications.

During 1951, as in other years, many patents have been issued to individual inventors but rights are assigned to some department or other of the United States Government. For the most part these inventors are working for the government directly or in research laboratories under specific contract with the government. Manufacturers throughout the country can usually get a license to make the items so patented without payment of royalties. In a recent government publication available from the U. S. Government Printing Office for one dollar is a list of 2,339 patents owned by the government which American businessmen can use without charge. Its title is Government-Owned Inventions for Free Use.

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ASTRONOMY

Carbon Monoxide In Sun

Find definite evidence of this gas, concentrated high in the sun's atmosphere where temperature is about 5,000 degrees Centigrade, from infra-red spectrum.

► CARBON MONOXIDE gas is now definitely known to exist in the sun's atmosphere.

Carbon monoxide, composed of one atom of carbon and one atom of oxygen, has long been believed to be one of the most abundant molecules in the sun's atmosphere. Its presence, however, has just been positively identified by Drs. Leo Goldberg, R. R. McMath, O. C. Mohler and A. K. Pierce of the McMath-Hulbert Observatory, University of Michigan.

The gas is concentrated high in the sun's atmosphere, where the temperature is about 5,000 degrees Centigrade. It signaled its presence in the infra-red region of the sun's spectrum.

Carbon monoxide is at least 40 times more plentiful than any of the other molecules that have been observed in the sun, Dr. Goldberg reported to the American Astronomical Society meeting in Cleveland.

Discovery of this gas will aid astronomers in two ways:

1. More information can be obtained about the temperatures and pressures existing in the upper layers of the sun's atmosphere.

2. Better information should now become available on the abundance of carbon and oxygen in the sun.

The observations which led to discovery of this gas were made with a lead sulfide photo cell and infra-red spectrometer both at the Mt. Wilson Observatory in California and at the McMath-Hulbert Observatory. This photo cell, a recent development, made it possible to study the infra-red portion of the sun's spectrum in great detail.

In the earth's atmosphere, carbon dioxide is generally abundant, but its half-brother, carbon monoxide, is much rarer and more irregular in its distribution.

"It must provisionally be concluded that carbon monoxide in the earth's atmosphere is localized in a most peculiar fashion," Dr. Goldberg pointed out.

Carbon monoxide has been detected high over the Jungfrauoch in Switzerland, but not in the air over Mount Wilson in California. It has been found over Columbus, Ohio, but is absent in the atmosphere over Flagstaff, Ariz.

Smog in the Los Angeles area might be expected to contain this gas, the Michigan astronomers point out, and some should be observed over nearby Mount Wilson. So far, however, carbon monoxide has not been detected from Mount Wilson. Further observations are planned in an effort to clear up this mystery.

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MEDICINE

Joint Injections Relieve

► INJECTION OF a close relative of cortisone directly into joints made painful by some kinds of arthritis, gout and bursitis brings relief.

Four Philadelphia physicians report that hydrocortisone or compound F can be used effectively in this new way.

In 69 patients with rheumatoid arthritis and 39 patients with osteoarthritis this method of using hydrocortisone gave prompt relief of pain, stiffness, swelling and tenderness in almost all cases. These good results and details of the treatment are reported by Drs. Joseph L. Hollander, Ernest M. Brown, Jr., Ralph A. Jessar and Charles Y. Brown, of the Hospital of the University of Pennsylvania, in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Dec. 22).

Hydrocortisone, like cortisone, is produced by the adrenal glands. Used in joint injections it is much more effective than

cortisone used in the same way, the doctors found. The reason for this difference is not known. The doctors suspect it is because hydrocortisone is only one-seventh as soluble as cortisone in blood plasma and therefore stays around the inflamed joint longer.

Results of this treatment in a few cases of bursitis, gout, disseminated lupus erythematosus and eye inflammations complicating rheumatoid arthritis are encouraging.

The joint injections of hydrocortisone must be repeated in order to keep the effect. In some patients these repeated injections have been continued successfully for as long as eight months.

Hydrocortisone is expected to be available to doctors generally within a short time. The amount needed for a weekly joint injection is small enough, the Philadelphia doctors point out, so that the cost should not keep patients from its benefits.

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