

ASTRONOMY

Planets Have Composition Similar to That of the Sun

THE earth and the other planets are apparently made of the same stuff as the sun.

Prof. Henry Norris Russell, the Princeton astronomer, discussing the subject at Mt. Wilson Observatory, Calif., observed that not only are the same elements present to a large extent both on the sun and the earth, but that contrary to previous notions there seems to be about the same proportions of each in the two cases. This fits the notion that the planets were formed of masses of matter ejected from the surface of the sun.

The new ideas on this subject came about from an investigation of the interior as well as the surface, or crust, of the earth. Of course, one cannot get down to the center of the earth, but with the help of chemical and seismographic studies scientists (especially Dr. V. M. Goldschmidt of Göttingen) have been led to the conclusion that the earth has a 2,000 mile core, called the siderosphere, composed of metallic stuff, mostly iron, cobalt and nickel. The earth's gold and platinum are also concentrated there where we can never get at them.

Outside the core is a dense shell or chalcosphere of sulfur compounds. Up towards the surface is a crust or litho-

sphere of more familiar material, mainly silicates. On the very surface, of course, is the hydrosphere and above it the atmosphere.

Some substances common in the sun are apparently less common on the earth because they are concentrated in the lower regions where we can not get at them. Sometimes substances are apparently rare because they mix with anything and do not form minerals of their own. For example, scandium and germanium were thought to be exceedingly rare on the earth, but fairly common on the sun. It is now known that there is plenty of scandium but it is so widely and thinly scattered that it never makes much of an impression.

It is lucky for us, Prof. Russell said, that the carbon and oxygen are mainly in the lithosphere, hydrosphere and atmosphere for these elements are essential to life as we know it. Actually about half of the original oxygen of the atmosphere has gone to make iron rusty, for that is the reason why we find red clay and sandstone. Ultimately all of the oxygen of the atmosphere will be removed by iron and then the human race will have to manufacture its own breathing material. Probably that explains the situation on Mars, which

has little atmosphere and practically no oxygen. The original oxygen must have combined with the iron to form rust and it is this rust which gives the planet its ruddy appearance.

Carbon dioxide, which is essential to plants, is continuously being exuded from the interior. But plants, especially those in the sea, are turning it back into minerals such as calcite. If there were no plants the atmosphere would become loaded with carbon dioxide and presumably that is what has happened on the planet Venus which has been found to have such a heavy atmosphere of this gas.

Thus, everywhere in the solar system the original materials seem to be the same, but the history of their development has been different in each case and has left on the surface different substances. This lends strong support to the already plausible notion that the matter in the planets was once part of the surface of the sun.

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ENGINEERING

World's Largest Elevator, Lifting Ships, Being Made

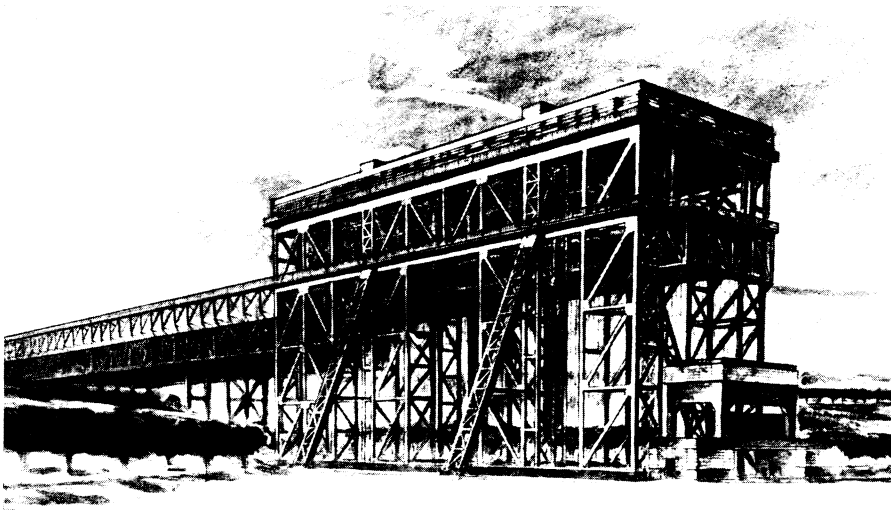
THE WORLD'S largest elevator is nearing completion in Germany. It will lift, not men or merchandise, but whole ships weighing up to 1,000 tons.

Another step to make Berlin an ocean seaport, the huge ship elevator is more than half completed at Niederfinow on the Oder River. The foundations are finally finished and within three years the completed structure is expected to lift river steamers 120 feet—as high as a ten story building—in about twenty minutes.

At Niederfinow now, series of canal locks do the same thing but take two hours for a single boat. A marine traffic problem likened to some of New York's taxicab jams results with undesirable frequency. Sometimes a hundred vessels were waiting to go through the locks and had to stand idle for days for the "lift" that sent them on their way.

After a vessel steams into the elevator tank, only five minutes is expected to be required to raise the tank with its contained water and ship up 120 feet. The additional fifteen minutes are needed to bring the vessel in and out of the tank.

Actually the weight to be lifted on each trip is about 4,200 tons or some 8,400,000 pounds. But nearly all of



LARGEST IN THE WORLD

Architect's drawing of an elevator, now under construction in Germany, which will be able to lift an entire ship.