PHYSICS—INVENTION

New Photoelectric Sunmotor Discussed By Its Inventor

By Dr. Bruno Lange
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(In an interview with a Science Service correspondent)

PATENTS on the newer photocells, with a fifty times augmented effect, have been applied for by myself and Siemens and Halske. As long as the patents have not been published, I cannot, for obvious reasons, tell what metal combinations I use in these new cells. The electrodes also differ in their arrangements from those already used by Grondahl and Schottky.

Application of these cells to the production of energy out of the sun's radiation seems to be possible, but of course this is a task which can be accomplished only step by step.

Aggregates of a larger number of cells connected with each other seems to be the direction of the next development. There are still many difficulties of manufacture and of circuiting to be overcome. Even if these problems are successfully solved, the direct production of sun-generated power will be able to go into competition with the methods of fuel-burning or waterpower only in tropical and sub-tropical climates, where a steady strong radiation exists.

The sensitivity of my cells is nearly the same as that of the human eye, the curves showing a value of only 10 per cent. less than that of the eye. The cells are peculiarly sensitive to color-differences and have a sufficiently large output of energy to be used for many purposes without amplification. We already have built up microscopes for metallurgical purposes, allowing an objective control, the ocular of the microscope being replaced by these cells.

The cells will probably be on sale within a month.

There are a large number of technical purposes and applications for them. We have succeeded already in transmitting phonograph records, working with infrared rays instead of with the usual disks. All sorts of signalling methods through dense fog are possible by these methods. Even infrared telephony over long range seems to be possible. This seems to be a very promising way for signalling to ships in fog. The determination of the sun's position by flying machines going through clouds is another possibility.

One of Germany's biggest liners is going to be fitted with a new smoke and fire control on this principle, the air from various parts of the ship being pumped through a system of tubes and passing in front of such cells. When smoke passes before the cell, it sets off an alarm.

Another technical application should be of importance in steel-mills. Sheets of red-hot iron passing through the rollers radiate enough light to work these cells. The changing of direction of the rollers can therefore be worked automatically by them.

A large number of scientific applications are foreseen. We have already built microphotometers with their help. Another useful device will be an automatic recorder for determining the correct time of photographic exposures.

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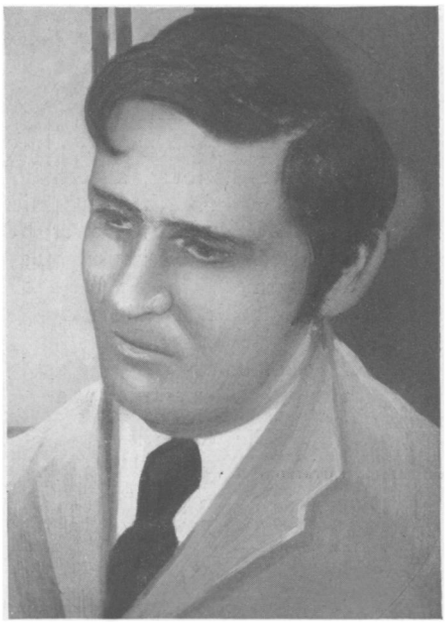

DR. BRUNO LANGE
Of the Kaiser Wilhelm Institute, Berlin, who has discovered how to use silver selenide to increase the efficiency of the light-sensitive copper oxide cell more than fifty times.

Electricity From Sunlight

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U. S. Bureau of Standards are among those who have made the most important contributions to the problem in America. Dr. Duhme and Prof. F. Schottky in Germany recently came very near to anticipating Dr. Lange in his success. The greater simplicity and effectiveness of Dr. Lange's invention appears to be due to his clearer understanding of the underlying phenomena.

Large scale power is what distinguishes present-day civilization from the past. The heat and light of prehistoric sunlight stored in coal or more recently in the water of lakes are the motive power of our large industries.

The new photocell developments promise an entirely new method of power production. The energy of the sun's rays streaming down ceaselessly day after day on the surface of the earth means an enormous waste of power. Dr. Lange has given a method which may prove successful in putting the sun to work for man throughout the future history of the world.

It is just possible the world is standing at a turning point in the evolution of civilization similar to that which followed the invention by James Watt of the steam engine. For coal is not only limited in amount. It is also an extremely inefficient vehicle for the sun's energy.

The power which can actually be used, for instance, in an incandescent lamp, is a small fraction of one per cent. of the total sunlight stored in part in the coal, whose burning at the generating station produces the electric current. Lange's invention promises to put a lot of the other 99 per cent. to use.

Serious problems will of course be raised by the fact that the supply of the sun-power will not be continuous. Whether these will be solved by some form of storage arrangement or by operating the photogenerators in conjunction with some other kind of generator cannot be said at present. The energy storage problem is closely linked with that of power sources.

Some $25,000 per kilowatt is the estimate that Dr. Lange has made of the cost of installing the copper sandwich on a large scale as a means of trapping the power of sunlight. This at first seems impossibly large as a hydro-electric station can now be erected at a capital cost of $100 to $300 per kilowatt of capacity. A steam turbine plant using