

perfect health. Hence, one goal of the future practitioner of medicine will be the attainment and maintenance of exuberant health, which is the inherent right of every person. A higher average of overflowing good health means a higher average of happiness, comfort, usefulness and economic value of the individual. The superman will never materialize without superhealth."

Medical education, Dr. Phillips went on to say, will place more emphasis on the human side and less on the mechanical and technical than at present. The curriculum of the undergraduate should be extended to include health conservation and the application of the principles of science through the personal relations of the physician and patient.

The address closed with a tribute to the importance of the general practitioner as a factor in the nation's health life and the significant statement that while the service rendered by a physician may not be considered in terms of finance it should be remembered that health conservation is of greater value than the sums paid out for helping the body repair the ravages of disease.

\*\*\*\*\*

#### METAL WELDING METHODS REVOLUTIONIZED BY NEW INVENTIONS

Methods of welding metals together will be revolutionized by two new inventions of the research laboratories of the General Electric Company, for after years of search it is now possible to weld so that the fused metal is as strong and as ductile as if it were never in two pieces. Previous methods, using an arc to furnish the intense necessary heat, resulted in the formation of compounds of the metal with oxygen and nitrogen so that the weld was not as strong as the rest of the piece.

As the nitrogen and oxygen which unite with the metal come from the air, in these new processes the air is excluded when the weld is being made by a bath of hydrogen, water gas, wood alcohol vapor, and others which do not easily form metallic compounds.

One of the methods was developed by Dr. Irving Langmuir, assistant director of the Schenectady laboratory, and makes use of what he calls flames of atomic hydrogen, based on a discovery of Dr. R. W. Wood, professor of experimental physics at Johns Hopkins University. Electric currents of twenty amperes and at voltages ranging from 300 to 800 were passed through two tungsten rods so as to form an arc similar to the arc between carbon rods in a street arc light.

By passing a stream of hydrogen gas into the arc from a small tube, an intensely hot flame is produced, because the molecules of hydrogen are broken up by the temperature of the arc into their constituent atoms. As the ordinary form of hydrogen is that of molecules, the atoms almost immediately recombine, but in doing so they liberate great amounts of heat, about half again as much as the oxy-hydrogen flame.

Iron rods an eighth of an inch in diameter melt within a few seconds when held about an inch above the arc, says Dr. Langmuir. Metals even harder to melt than iron, such as tungsten and molybdenum, one of the most refractory substances known, melt with ease. Quartz, however, melts with more difficulty than molybdenum, which Dr. Langmuir suggests as being due to the fact that the metals act as a catalyzer

or a substance which speeds up a chemical change.

"The use of hydrogen under these conditions for melting metals has proved to have many advantages," Dr. Langmuir said. "Iron can be melted or welded without contamination by carbon, oxygen or nitrogen. Because of the powerful reducing action of the atomic hydrogen, alloys containing chromium, aluminum, silicon or manganese can be welded without fluxes without surface oxidation. The rapidity with which such metals as iron can be melted seems to exceed that of the oxy-acetylene flame, so that the process promises to be particularly valuable for welding.

The other method of producing ductile welds was developed at the Thomson Research Laboratory of the General Electric Company at Lynn, Mass., by Peter Alexander, independently of Dr. Langmuir's work. The electric arc is passed between the metal to be welded and an iron electrode, and the gaseous atmosphere is supplied in the form of a stream around the arc, so as to keep it entirely away from air. Pure hydrogen, water gas, methanol or wood alcohol vapor, or dry ammonia can be used, as well as a mixture of hydrogen and nitrogen, for it is found that the nitrogen is not harmful unless oxygen is also present. All of these mixtures contain hydrogen, and Dr. Langmuir suggests that this method also depends in part for its efficacy on the disintegration of hydrogen molecules into their atoms.

-----

#### GERM THEORY OF CANCER REFUTED

The germ that causes cancer, if there is one, has not been discovered yet. Dr. James B. Murphy of the Rockefeller Institute for Medical Research has repeated the experiments of Dr. W. E. Gye and J. E. Barnard which attracted such wide attention last summer and in a report of his results appearing in a recent issue of the Journal of the American Medical Association he holds his experiment refutes their contention that chicken tumor is caused by a micro-organism.

The English scientists reported that they produced tumors in chickens by injections of the filtered juice from chicken tumor in the presence of a second chemical factor. They also produced tumorous growths in chickens with filtrates from malignant growths from other animals - mice, rats and even humans, in the presence of this second factor. This necessary secondary element was nothing else than filtered juice, or filtrate of chicken tumor treated with chloroform. None of these substances would produce a tumor or cancer when used alone.

By means of a complicated ultra-microscope employing ultra-violet light they studied the cell-free filtrate and detected the presence of a micro-organism which they believed was the causative agent of cancer.

A cancer consists of rapidly subdividing cells that keep on growing and will not stop. Such a condition of normal growth is found in the rapid cell subdivision of an embryo. At the Rockefeller Institute it was decided to try to produce a cancerous growth with a filtrate from embryonic tissue used in the same way as the juice from the malignant growths. In accordance with this idea the filtered juice from ground-up bits of chick embryo and rat placenta were injected into hens along with the chloroform treated filtrate of chicken tumor and it was found that cancer resulted just as it did following the injection from malignant growths.