

GENERAL SCIENCE

Blind Spots of Science

Science Service director calls for exploration of longer life, viruses, human personality, chemical elements, universe, photosynthesis, protoplasm, automatism.

► MAJOR BLIND spots in man's scientific knowledge, unknowns that are worthy of science's most skillful and energetic probings, were listed by Watson Davis, director of Science Service, in a paper before the American Association for the Advancement of Science.

These constitute the stuff of the future upon which technologic advances will be based, Mr. Davis declared, provided scientists are released from the inhibiting secrecy in which the military wish to continue to ensnare them.

The ten major unexplored areas listed by Mr. Davis are:

1. Living longer: the prolongation of life, the retarding of old age, the prevention of premature senility, which means the conquest of degenerative diseases, among them cancer, heart and circulatory disorders, nephritis, arthritis, and diseases of the respiratory system and the brain. We should be able to live and work a half generation longer.

2. Virus conquests: least controlled of all infectious diseases those caused by viruses, such as colds, poliomyelitis, need their nemeses, their sulfas and antibiotics.

3. Healthier personalities: mental ills, ranging from chronic grouches to disabling psychoses, take major tolls. Disordered personalities have physical, mental and emotional bases. Mentally warped personalities give rise to crimes against society, including making of wars.

4. Exploration of the elements: new chemical elements are still to be discovered, probably a half dozen or so. Transmutations (not alone of uranium) and properties of older ones need exploration. Undiscovered sources should be sought for elements little-used because scarce. Particles within the atomic nucleus yet unidentified may exist.

5. Exploration of the universe: the impact of astrophysical knowledge of the universe around us may be more philosophical or religious than technologic, but sun, stars and galaxies have their down-to-earth effects. Experiments of immense time and size are in progress.

6. The secret of photosynthesis: despite the energy released from within two atomic nuclei, our main source of energy is the sun, whose radiation is converted by photosynthesis in growing plants, a

process we do not understand and can not duplicate in any factory.

7. The secret of protoplasm: the living cell is the seat of life itself. An explanation of its protoplasm may explain life. Nuclear chemistry of the living cell may be more revealing than nuclear chemistry of the elements.

8. Automatism: the lever, wheel and such simple devices were beginnings; steam, electrical and internal combustion engines were further steps; the electron tube is the prime servant of automatic operation today, peaking in complex electronic computing machines that almost think in a routine way. Automatic operation applied to factory, farm and home, assuming the burden of human drudges, may give time for more creative thinking and doing.

9. World brain: civilization's memory is in its records, its books, its literature, its handed-down lore and customs. Overburdened human brains forget. Our world organization or disorganization of knowledge has its lapses of incomplete records, its Babel of languages, its geographical stagnation, its confusion of classification and its overpowering bulk. The intelligence of the world may be intelligent enough to mobilize for use its intelligence.

10. Psychological welfare: in the stress of war, all the skill of psychological interpretation (propaganda, if you will) and all the machinery of mass communication are devoted to world-wide mutual understanding (of our side). This psychological warfare needs to become peaceful psychological welfare, a process of peoples knowing and understanding within and across man-made borders. This will be the essence of peace, which history shows is one of the greatest of unknowns, worthy of the most intense and earnest scientific research.

Science News Letter, April 6, 1946

ELECTRONICS

Largest Turbine Generator Is Under Construction

► A GIANT, 100,000-kilowatt turbine generator, largest of its type in the world, is now under construction at the



HUGE FORGING—Many weeks of highly-skilled work will be required to transform this 75,000-pound forging into a precision-machined shaft, which will operate at 3,600 revolutions per minute. It will be used on the huge turbine-generator under construction by General Electric. Parts of the turbine known as "buckets" will operate at the supersonic speed of nearly 900 miles per hour.

General Electric Company's turbine factory in Schenectady, N. Y.

Designed to operate at 3,600 revolutions per minute, the streamlined generator will be 77 feet long and 17 feet in maximum width. Turbine buckets on the generator will rotate at the record velocity of 1,300 feet per second or nearly 900 miles per hour.

Steam, entering the turbine at 1,000 degrees Fahrenheit with 1,250 pounds of pressure per square inch, will pass through a series of bucket wheels rotating the turbine rotor and driving the huge generator.

In one-tenth of a second, the steam's temperature drops to about 70 degrees Fahrenheit and the air pressure becomes a near vacuum. The steam becomes water and goes back into the power plant system to again be heated into steam.

Huge rough castings are used in the construction of the generator which is being built for the Public Service Electric and Gas Co., New Jersey. The forging for the generator shaft weighs 75,000 pounds.

Science News Letter, April 6, 1946