GENERAL SCIENCE

Science's Ethical Dilemma

Prof. A. V. Hill, speaking as president of the British Association for the Advancement of Science at Belfast, discusses dangers and morality of science.

Excerpt from the presidential address before the BAAS by Prof. A. V. Hill, physiologist, Nobelist and Foulerton Research Professor of the Royal Society.

➤ NUCLEAR FISSION has released the threat of unprecedented violence, with the possible destruction of many millions of lives and the accumulated treasures, moral and material, of civilization. The individual conscience may tell a man to have no part in it: that is easy enough, for there are plenty of other interesting things to do, but it does not solve the problem. Moreover, it is possible that defensive weapons, based on nuclear fission, but not of the type intended for mass destruction, can be developed which would make armed aggression intolerably costly.

What then of the abolition of secrecy? In principle, yes, for the historic and unique contribution of science to international goodwill has been in sharing knowledge regardless of race and frontier, and the chief satisfaction of scientific work, the condition of its fruitful development, is frank and free discussion.

"Cast thy bread upon the waters, for thou shalt find it after many days," is wise and acceptable counsel in dealing with scientific knowledge: while "he that observeth the wind shall not sow and he that regardeth the clouds shall not reap," is as aptly applied to human relations as to agriculture.

Every possible endeavor, therefore, should be made towards international agreement on sharing scientific and technical knowledge and controlling nuclear weapons: but this, like peace itself, is a concern of every citizen, not only of scientific people.

Much scientific and technical advance has led to unexpected dangers and difficulties. Without our present knowledge of bacteriology and preventive medicine, gigantic armies could never be kept in the field, and land war on the recent scale would be impossible: is medical science, therefore, to be blamed for twentieth-century war? The indiscriminate use of insecticides, by upsetting the balance of nature, can quickly do more harm than good. Radio communication may be used for spreading lies and disorder as well as truth and goodwill. Developments in microbiology, in many ways beneficient, may be used in the future for biological warfare, with effects at present unpredictable; and control by international agreement and inspection might be very difficult.

The list need not be multiplied, all are aware that every new benefit to mankind provides also its own dangers, either as unexpected consequences or by deliberate misuse. Science is not alone in this: liberty may lead to license, religion can be used to inflame passions, laws can be exploited to protect wrongdoing. If scientists feel called upon to examine their consciences, so much the better: but they need not imagine that in this they are exceptional!

It has been debated whether "the scientific mind is fundamentally amoral." The real answer is that there is no such a thing as *"the* scientific mind." Scientists for the most part are quite ordinary folk. In their particular scientific jobs they have developed a habit of critical examination, but this does not save them from wishful thinking in ordinary affairs, or sometimes even from misrepresentation and falsehood when their emotions or prejudices are strongly enough moved. Their minds are no more amoral than those of surgeons, lawyers, or scholars. As investigators most of them realize that their function would be stultified were they to introduce moral data into a scientific argument.

A surgeon is not required, or indeed allowed, to consider whether it would be better for the world if his patient died under the operation, he has only to carry it out with skill, care and integrity: but it would be foolish to conclude that the surgical mind is amoral. The surgeon himself, as a human being, has to make moral judgments: but he does so outside the operating theatre.

So it is with scientific people: like all good citizens they must take account of ethical considerations, and the chief of these, as with other good citizens, are of integrity, courage and goodwill. Integrity forbids them to allow feelings of any kind to obscure facts, but that does not make them amoral: after all, integrity is the first condition of morality.

In the practical world of today, complete abandonment of secrecy, in government and industry, is out of the question. The advantages to international relations, and to general scientific progress, of the greatest possible freedom are evident; to these can be added the impossibility, in a free democracy, of keeping the best people unless the conditions of their work are congenial. If scientific men consistently avoid jobs which seem to them to fall short of reasonable freedom, they will force changes of organization so that only necessary secrecy is maintained. The penalty of filling an organization, governmental or industrial, with second-rate people, cheerfully amenable to unnecessary restrictions, is far too evident in its result on efficiency to be tolerable for long. The cure, therefore, is largely in scientists' own hands. In this, as in many other aspects of their work, moral considerations come in, and the only way to resolve the dilemma which is in so many minds is to discuss it frankly. To neglect it altogether is not amoral but immoral, it is the duty of all of us as citizens to consider the ethical basis of our work.

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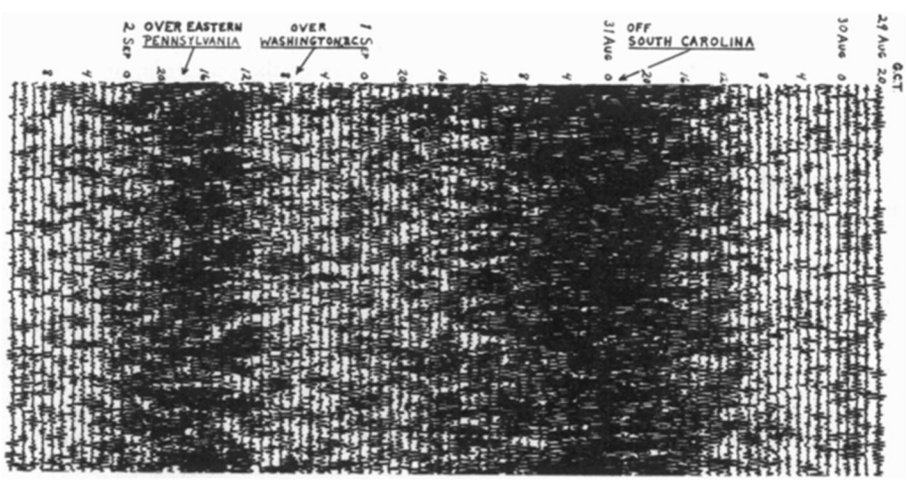
SEISMOLOGY

Two Seismograph Peaks Show Recent Hurricane

➤ THE HURRICANE that lashed the East Coast over Labor Day weekend was recorded on a seismograph at the U. S. Coast and Geodetic Survey in Washington. Microseisms generated by the superstorm show two black, very well-defined peaks.

The peaks, Leonard Murphy of the Survey explained, indicate the path of the twirler, and the records are not often clear enough to do this. After slamming the East Coast



HURRICANE'S MICROSEISMS—The two black areas in this seismograph are caused by the many microseisms from the hurricane that swept the East Coast Labor Day weekend. The unusually well-defined peaks occurred when the storm's center was over the Atlantic.

FLAME-THROWING TANK—One of the Army Chemical Corps' newest weapons is the giant flame thrower, mounted on an M-47 medium tank, shown in the photograph.

near South Carolina, the storm moved northeast over upper Virginia and Maryland, then whipped through eastern Pennsylvania, lashing the New York area.

Microseisms register when the low pressure area at the storm's center is over the ocean.

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GENERAL SCIENCE

Company Magazines Using More Science

➤ THE NATION'S leading house magazine editors are using more stories of science today than at any time in their history.

Nearly 40% of all editors surveyed by the Gebbie Press in a nation-wide poll say that at least one story dealing with scientific material appears in every issue of their publications, and that they wish they had more such stories.

The birth of the atomic age and private industry's vast contributions to both the wartime and peacetime uses of atomic bombs and by-products are credited with creating much of the editors' interests in science, according to the Gebbie Press.

Many company publications that before the war never deviated from the tried-and-true editorial approach of presenting purely local company news and gossip now devote considerable space to scientific stories.

Results of the survey, published in a 190-page volume titled "The Nation's Leading House Magazines," show that stories with scientific subjects or slants even out-pull women's fashion copy and cheesecake pictures. (See SNL, July 12, p. 28.)

The 1,400 house magazines polled have 55,000,000 combined circulation.

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SURGERY

Gallstones Operation For Baby Under One

➤ THE FIRST case recorded in medical history of gallstones in a baby under one year with recovery of the baby is reported by Drs. William H. Snyder, Jr., Lawrence Chaffin and Leon Oettinger of Los Angeles in the *Journal of the American Medical Association* (Aug. 30).

About 90 cases of gallstones in infants have been reported since the first one was recorded in 1767, almost two centuries ago, by J. Lieutaud in a French medical journal. In all of these earlier cases, however, the baby died and the condition was discovered or confirmed in examination of the infant's body after death.

The baby who is the first known to survive is a girl. She thus fits one of the five F's—female, fair, fat, forty and fertile—which used to be taught as a description of the typical gallbladder disease patient.

This baby girl was six weeks old when admitted to the Los Angeles Children's Hospital with a diagnosis of intestinal obstruction. At operation, one small stone was found in the gallbladder, which had ruptured, and numerous gall stones were found in the common bile duct, which conveys bile to the first part of the small intestine. This duct was so small and crowded with stones that the surgeon had some difficulty in getting them out. He solved the problem by fitting a narrow bore plastic tube into the common duct and forcing the stones out under syringe pressure.

The baby recovered and is still well three months after operation, the three doctors report.

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TECHNOLOGY

New Flame Thrower Mounted on M-47 Tank

➤ THE LATEST U. S. medium tank has a new flame thrower as its main armament, replacing the usual cannon. Built primarily for use of the Marine Corps in assault operations, a giant flame thrower is mounted on an M-47 body.

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PSYCHOLOGY

Dogmatic Persons' Politics Vary Widely

➤ COMMUNISTS ARE not the only ones with dogmatic opinions. In fact, dogmatic individuals are found in just about equal numbers among the extreme leftists, extreme rightists and among the middle-of-the-roaders. They may be dogmatic about politics, religion, philosophy or science.

This was disclosed by a study of the opinions of college students reported by Dr. Milton Rokeach of Michigan State College, Lansing, to the American Psychological Association meeting in Washington.

Some personality traits are common to all strongly opinionated persons, Dr. Rokeach said, whether they are liberals, conservatives or in-betweens. They are intolerant of criticism. They need to over-identify with some cause. They want to punish the renegade from their particular ideology. They do not like to compromise, but are willing to be martyred for the cause. They tend to dislike themselves and to be suspicious of others and they fear to be alone.

Dogmatic persons are inclined to subscribe to statements prefaced with some such extreme wording as "Only a simple-minded fool would think that . . ." followed by some remark about America, Russia, China, labor, God, race differences, MacArthur or other controversial subject.

Dogmatic persons are those most likely to accept dictatorship, Dr. Rokeach found.

A measure of dogmatic personality and a scale for picking out opinionated persons have been developed by Dr. Rokeach on the basis of his findings.

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PSYCHOLOGY

He-Man Music Preferred by All

➤AMERICANS PREFER music they judge to be masculine, especially when they know others think that the music is fit for he-men.

Both sexes consistently prefer masculine music, Dr. Carl H. Rittenhouse, psychologist at Lowry Air Force Base, Denver, Colo., told the American Psychological Association. The most masculine men and women with mannish manners have strongest preference for masculine music.

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