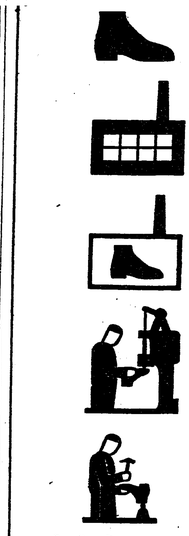
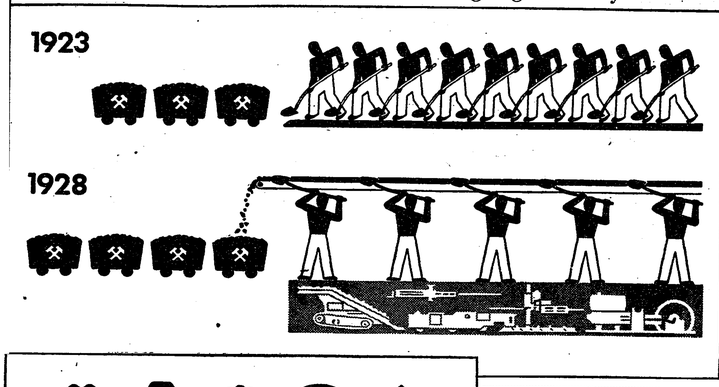
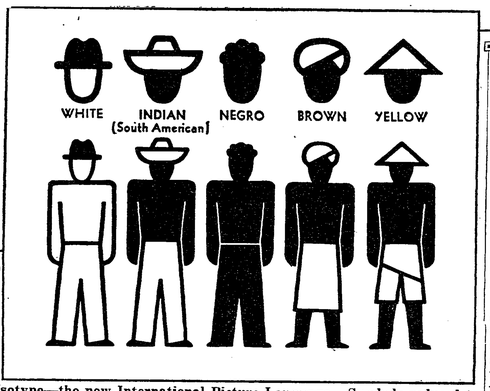
THE WEEK IN SCIENCE: RAYS KILL INFLUENZA VIRUS

Ultra-Violet Machine Tests the Possibility of Preventing Transmission of Disease—A Language of Symbols







Isotype—the new International Picture Language. Symbols reduced to the fewest lines—no faces, no hands for human figures—are combined to convey facts about social trends, effect of depressions and growth of populations. Only indispensable explanatory words accompany the pictures. Directly above, isotypes for human races. Top, unemployment caused by introducing machines in an Austrian coal mine.

By WALDEMAR KAEMPFFERT

LAST Summer we immortalized in these columns Drs. W. F. Wells and H. W. Brown of Harvard's School of Public Health. And this for the reason that they had shown one method whereby influenza virus is transmitted.

Everybody with influenza or a cold sneezes and coughs. Droplets are expelled. They evaporate and leave a residue in suspension. Wells and Brown found that these dried droplets will not settle readily but drift about for thirty minutes. Are they still virile?

The two experimenters atomized the liquid suspension of virus collected from ferrets into a tank. Air from the tank was then tested. Samples passed through ultra-violet light and inoculated into ferrets proved to be harmless. Other samples not thus irradiated and sterilized brought about influenza in ferrets.

The conclusions are easy to draw. Influenza virus can be transmitted from lung to lung in the open air. Also it can be killed by ultra-violet rays.

Last week came the announcement that this discovery is now being tested in everyday life. Dr. Wells and his wife (Mrs. H. M.) installed tubular ultra-violet lamps across a corridor in the Children's Hospital, Boston, in surgical operating rooms and in an imitation railway car. Daily nurses, doctors, "railway passengers" pass through the barrage of virus-killing rays.

The Tests at Boston

Is this the way to combat influenza in large cities and crowded places? The answer will be given after the Wellses have completed their tests. They are still in the fact-gathering stage. And the facts are gathered by means of mechanical "infectors" and "infectees," as THE TIMES' Boston man graphically called them last week.

The "infector"—"it's as big as two superimposed clenched fists," reports our man—sprays droplets of virus into the air. The "infectee" resembles "a small old-fashioned churn"—again our Boston artist in visualization speaks—and breathes the droplets. Now the ultra-violet rays are on, and now they are off. Samples are collected to see whether the rays kill as effectively in the open as they do in tanks.

If ultra-violet rays really kill influenza virus in this easy way we must hail an important development in preventive medicine. For not only will influenza be under control but perhaps other virus diseases as well. Among them are measles, whooping cough, smallpox, infantile paralysis, scarlet fever, diphtheria and meningitis.

* * *

IT SEES MOVING THINGS

Petoscope Is a New Variation of the Photoelectric Cell.

PHOTOELECTRIC cells, commonly called "electric eyes," are so common that this editor long ago ceased to describe their uses. But along comes Alan Fitzgerald, research associate in Swarthmore's electric engineering division, with a new photoelectric cell which is worth reporting. He is the designer of what he calls a "petoscope," a combination of two Greek words meaning "seer of flying objects." Unlike any other photoelectric cell, the petoscope detects motion at a distance.

As every one knows at this late day, a photoelectric cell changes light into a feeble electric current. Amplify this current and it is possible to start and stop an electric motor, ring a bell, sound a horn by closing a local circuit. In the Pennsylvania Station, at New York, doors fly open automatically before a passenger carrying luggage in both hands. He has interrupted a beam of light that plays on a photoelectric cell, whereupon a local motor circuit becomes active.

"A beam of light and a cell can be used in this manner only if you know beforehand where your moving object is likely to be," explains Fitzgerald. "My petoscope detects a moving object anywhere in the open. The ordinary photoelectric cell is an eye in a fixed head and at that not nearly so good as a living eye."

The "Eye" Detects Motion

The principle is simple. Imagine a squirrel sitting on a branch in the woods. He sees you, but you do not see him so long as he does not move. But let him leap and you become aware of him. With the petoscope it is the same—so long as objects are still it "sees" nothing; as soon as they move it knows it.

Fitzgerald asks you to imagine yourself standing on one side of a picket fence. On the other side a man is walking past. He flickers, as it were, because the pickets intervene between him and the eye. Now you see him, now you don't. Fitzgerald puts the picket fence—a row of slats in his case—within the petoscope's camera-like box. "Continuous movement within the field of view causes a fluctuating or alternating component in the photoelectric currents," explains he.

Unlike any photoelectric device that has gone before, the petoscope does not respond to a steady light no matter how bright. There must be a changing rate of illumination—just the kind of change that a moving man, airplane, or automobile would bring about.

For a test Fitzgerald took the petoscope out to Patco Airport on the Ridge Pike and two pilots made a number of flights to discover at what height a plane could be detected. The instrument was pointed at the sky. As soon as the airplane came into the range of vision at altitudes varying from 2,000 to 3,000 feet a bell was rung. "If it had been wartime, we could have sounded sirens all over the city as easily as ringing a bell," says Fitzgerald.

* * *

LANGUAGE OF ISOTYPES

A New, International Means of Communication Gains Use

ABOUT five years ago a new method of presenting facts came out of Vienna—a method now so widely introduced that nobody seems to know who invented it. Instead of inaccurately comparing the strengths of the Red and Blue armies by two soldiers—one tall and red and the other short and blue—the eye fell upon a row of twelve red soldiers and upon a row of five blue ones. "Each soldier stands for 20,000 men," read the caption. That was all. At a glance it became evident that the Red army numbered 240,000 and the Blue 100,000.

Here is an entirely new method of presenting facts rapidly, easily and correctly by pictures alone. Moreover—and this is not generally known—it is only a small part of an entirely new international "language" which substitutes picture symbols for words.

The Originator

Its creator is Dr. Otto Neurath, social scientist and philosopher, who developed it in the Museum of Social and Economic Science at Vienna (which he founded and directed for ten years) and in the Mundaneum of The Hague, Holland. He believes so strongly in pictures that he even signs his letters with a picture of an elephant. This because he is a huge man who weighs 200 pounds and maybe—who knows?—because he is also very wise.

Already there is in existence a rapidly growing dictionary of "isotypes" or symbols. With these are presented machines, plans of cities, statistical facts, growth of populations, historic trends, variations in the production and consumption of wheat, iron, cement or anything else. It would take a whole book to explain what a single isotype chart sometimes sets forth.

Sentences are constructed to convey ideas to those who know the words and the grammar. So with Neurath's isotype method. The pictorial symbols are the equivalent of words. They are put together to convey facts or ideas very much like the building blocks with which children still build houses. The result is a picture that burns itself into the mind, each symbol cooperating with the others to tell a coherent story.

Detail Omitted

The isotypes themselves, the individual signs, are the essence of simplicity. Irrelevant detail is ruled out. Everything is reduced to its bones. Human figures have no faces—just heads; no hands—just arms. Merely by his hat—or lack of it—does an isotype identify a white man, a Latin American Indian, a Negro, a brown East Indian, a Mongolian. A shoe is a silhouette; a factory a rectangle with a chimney. Put the shoe in the rectangle and we have a sign that means "shoe factory." If smoke comes out of the chimney and the doors are open the factory is busy; if there is no smoke and the doors are closed the factory is idle. A simple picture of a telephone with an arrow is enough to indicate anywhere on earth that here it is possible to telephone. A pile of coins stands for "money." A letter superimposed on an airplane means "air mail."

Isotypes have already demonstrated their pedagogic value in schools abroad. "Given good pictures, we are not so dependent on good teachers," says Neurath. "Also, we limit the amount of harm that a bad teacher can do." In other words, children can learn from simple, first-class material with the aid of second-class teachers. Because isotype pictures are self-explanatory the burden on the good teacher is lightened. And education becomes truly democratic.

It is much easier to identify isotypes and interpret their message than to compose them into charts. For this a period of training is necessary. But the result is a pictorial method of communication far more international than any living tongue and more immediately intelligible. A few words of explanation may be required—for example, "each figure stands for 20,000 men"—and these are, of course, printed in the language of the country. In this respect, Neurath's pictures are like geographic maps which also require a few legends.

Ordinarily pictures are used to illustrate a text. But text is used to elucidate isotypes. And this text is reduced to simple, clear relationships. Neurath has delivered extemporaneous broadcasts in Europe with nothing more before him than his own isotypes. They always proved to be his simplest and most popular lectures.

Draftsman's Job

The draftsman has no more right to exercise his imagination or do what he pleases in making an isotype chart than he has when laying bricks in accordance with the instructions on a blue print. He is merely a tool in the hands of an expert who has studied the message to be communicated by a scientist, historian or economist, and decided what symbols or isotypes shall be used and how they shall be combined to attain the desired effect with the least expenditure of intellectual effort.

"Transformation" is the name given to this process. Marie Reidemeister is probably the most expert of Neurath's "transformers." Best isotype designers are Gert Arntz and Erwin Bernath.

Note that isotype pictures are always dispassionate, always objective, always factual, always as practical as a hammer or a toothbrush. Emotion is deliberately excluded. If the usual book were to be so utterly factual it would be monotonous. Pictures do not tire so readily. "But they must be composed and used with care," warns Neurath, "and this because impressions are easily superimposed." Hence his insistence on the very simplest symbols drawn with the fewest possible lines and on the studied avoidance of uninformative, decorative detail. "Don't put in anything that occurs to you just because you think it's picturesque or interesting," reads one of his rules. "And don't try to be artistic."

Opposite of Art

An isotype pictograph is the direct opposite of a landscape by Landseer or a highly detailed picture of Dutch life by Breughel. The longer you study the Landseer or the Breughel the more you discover touches to admire or condemn. But the possibilities of an isotype composition are rapidly exhausted. At the first glance the general story is taken in; at the second some minor points; at the third still others that the creator saw fit to incorporate. "Take that thing away," roars Neurath if a fourth is necessary. "There's too much unnecessary detail."

The symbols are applicable to any educational purpose—popularization of science, effects of wars and depressions, best ways to eradicate diseases, teaching foreign languages. Even infants can use isotypes instead of building blocks. Neurath has worked out Punch and Judy plays in which the same symbols (characters) recur. The method is not only comprehensive, not only encyclopedic, not only international, but utterly independent of age and formal education.

Written and spoken language varies with the class to which it is addressed. The printed messages of a child's primer, of a newspaper, of a textbook on chemistry, are all different, ranging as they do from the utmost simplicity to technical complexity. A book on the theory of money and credit is not likely to be easily understood by a laborer.

Means to Bridge Gap

It is one purpose of isotypes to bridge the intellectual gap between the college professor and the masses to whom he wishes to appeal. To be sure, the professor will extract more from an isotype chart than one who has never had more than a common school education, just as the intelligent, sensitive novelist who wanders through a strange city sees more meaning in churches, shops and wayfarers than does a worker. Yet it may well be that out of the pictures as out of the city and its sights the worker can extract something that may be lost upon the novelist.

There is not the slightest intention of substituting isotypes for ordinary print. Their uses are limited—indeed, more limited than those of words and sentences. They stand supreme in the rapidity and directness with which they convey their facts.

Neurath's system of visual education is already in extensive use, especially in the United States. But there is no consistency in the manner in which it is carried out and used. Each teacher, advertiser, illustrator, government bureau or business head modifies it in his own way, usually without realizing the necessity of obeying what is the equivalent of rules of spelling and grammar. There is need of standardization if an isotype chart is to have the same meaning for Frenchman and Chinese—need of some authority to decide what symbols shall be used and how they shall be assembled.

International Development

To standardize this new international picture language and to develop its dictionary of symbols the International Foundation for the Promotion of Visual Education has been created at The Hague, Holland, with M. Fleddérus as its president. In this country a center is about to be established where isotypes are to be prepared and where teachers of the system are to be trained.

There will also be an encyclopedia—the strangest and most useful encyclopedia ever published. It will consist entirely of Neurath's isotype pictures with just enough words to accompany the symbols. Give it to Jack Smith in the fo'c'stle of a ship or to Einstein and each will absorb more information from it in five minutes than he could from the millions of words in an ordinary encyclopedia.

* * *

THE CHANCE TO LIVE

Violent End Held More Likely Now Than in the Past.

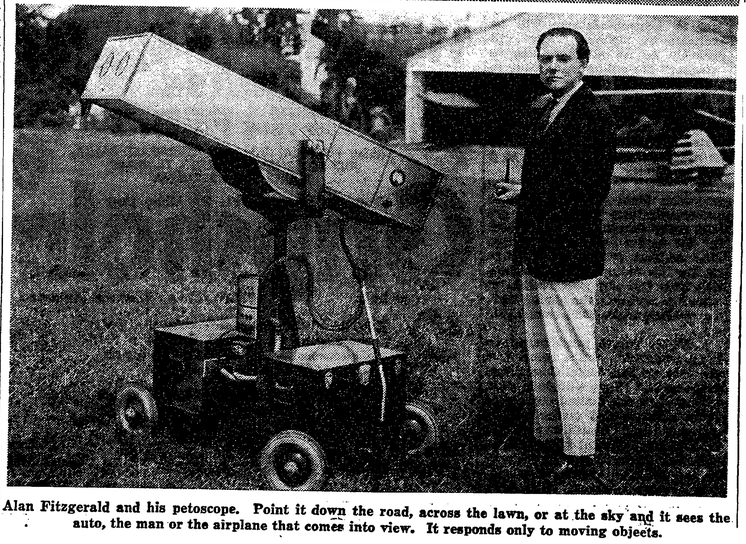
WE live longer on the average than we ever did, largely because babies no longer die almost like flies. But Dr. René Sands, Secretary General of the Ministry of Public Health of Belgium, makes life in a modern city seem precarious by telling us in the Milbank Memorial Fund Quarterly that we in America are much more likely to come to a violent end than were residents of London between 1660 and 1679. Our machines, our railways, our craze for sports, our automobiles, our airplanes are the reasons.

Look at these figures and then wonder what's wrong with the United States:

VIOLENT DEATHS FOR EVERY 10,000

London (1660-1679)	7.60
London (1801-1810)	4.00
United States (1932)	9.86
Germany (1932)	6.90
England and Wales (1933)	5.62
Netherlands (1932)	3.80

So it turns out that the Netherlands is about the safest country on earth. (We have not reproduced the complete table, so that our word must be taken on that score.) Scarcely any progress at all has been made since the early nineteenth century in escaping death from what the statisticians politely call "external causes."



Alan Fitzgerald and his petoscope. Point it down the road, across the lawn, or at the sky and it sees the auto, the man or the airplane that comes into view. It responds only to moving objects.

The New York Times
Published: January 17, 1937
Copyright © The New York Times